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Quality Management: Scoping Study

For internal GAO use

Preface

The Office of the Assistant Comptroller General for Operations prepared this Quality Management: Scoping Study in response to a Comptroller General request to follow up on the June 6, 1990, visit to GAO by Dr. W. Edwards Deming. This study had three key objectives:

- to highlight the philosophies and principles of the leading quality management experts,
- to summarize the experiences of other organizations that have adopted a quality management approach, and
- to assess the implications of adopting a quality management approach at GAO and present an implementation strategy.

This study revealed that a major transformation is occurring in the United States in the way that quality management is defined and applied in organizations. We also learned that many of the best practices of leading organizations are applicable to GAO and offer opportunities to improve the way we serve the Congress and meet the monumental challenges facing our nation. This study has six chapters:

- Chapter 1 provides a history of GAO's interest in quality management and describes how the study was performed.
- Chapter 2 describes the history of quality management in the United States and introduces the significant experts and ideas in the field.
- Chapter 3 documents the quality management practices of leading organizations and summarizes the most important lessons learned.
- Chapter 4 examines the attributes of GAO's culture and organization that will influence GAO's ability to adopt a quality management approach.
- Chapter 5 recommends a strategy for implementing quality management at GAO.
- Chapter 6 includes specific steps that are recommended during the first phase of GAO's quality management implementation.

Appendixes and a bibliography are also included.

Preface

This Scoping Study is a tool to assist GAO management in determining the role quality management philosophies and principles can play in carrying out GAO's mission and building a vision for meeting future challenges.



Ira Goldstein
Assistant Comptroller General for Operations

Preface

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Abbreviations

BARS	Behaviorally Anchored Ratings Scales
CEO	chief executive officer
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services (Office of)
CIT	continuous improvement team
CSF	critical success factors
DEC	Digital Equipment Company
DELTA	DEC Employees Leveraged Team Activities
DES	Division of Engineering Services
DISC	Defense Industrial Supply Center
DOD	Department of Defense
EAG	Economic Analysis Group
EI	employee involvement
FQI	Federal Quality Institute
FTD	Federal Tax Deposit
GAO	General Accounting Office
GGD	General Government Division
HHS	Department of Health and Human Services
IBM	International Business Machines Corporation
ID	identification
IRS	Internal Revenue Service
ITC	International Trade Commission
ITT	International Telephone and Telegraph
NASA	National Aeronautics and Space Administration
NAVSEA	Naval Sea Systems Command
NIH	National Institutes of Health
NSIAD	National Security and International Affairs Division
OCG	Office of the Comptroller General
OMB	Office of Management and Budget
OPM	Office of Personnel Management
PMP	participative management program
RASC	Regional Administrative Services Center (of San Francisco)
SPC	statistical process control
SSA	Social Security Administration
STEP	Strive for Excellence in Performance
TEF	Trade, Energy, and Finance
TQM	total quality management
USAA	United Services Automobile Association
USDA	U.S. Department of Agriculture

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Introduction

GAO has always met challenges with a sense of pride and professionalism. Today, a number of critical issues are challenging our nation and GAO as never before: a \$3 trillion national debt, the need for restructuring financial institutions and markets, the lack of a new framework for considering national and economic security, a faltering health care system, a festering problem with nuclear waste cleanup, a weak educational system, and too many cities ravaged by crime and drugs. The overall impact of these problems fosters an urgent need for government to examine the issues in new ways.

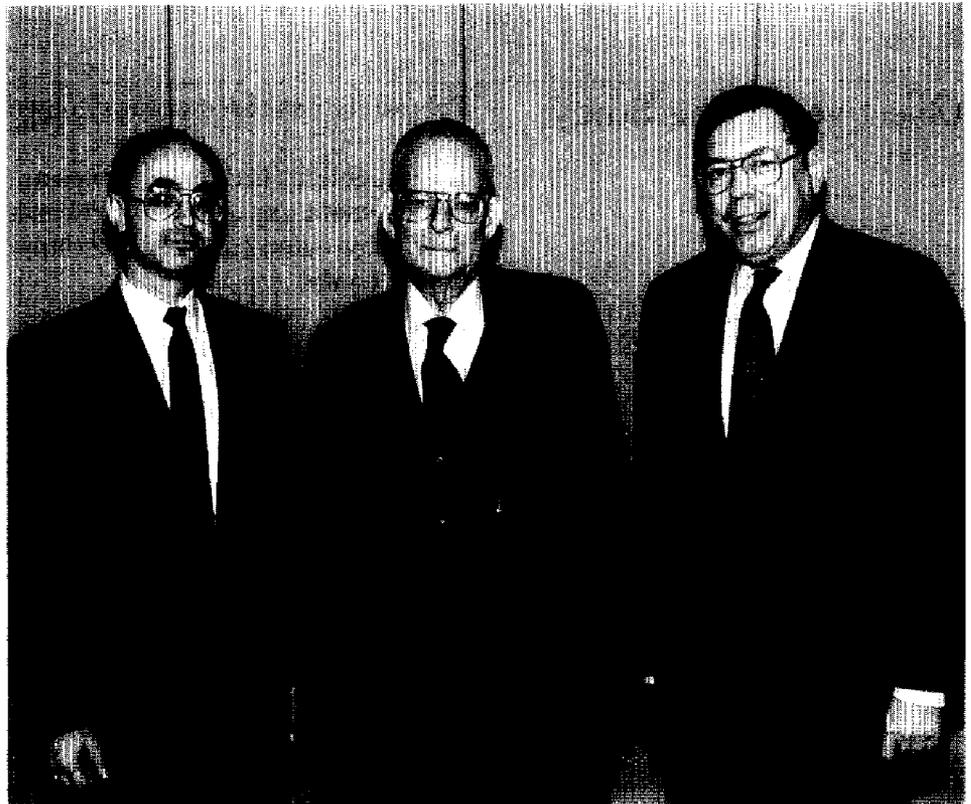
At GAO, we must increasingly ask whether our traditional approaches to managing and performing our work will enable us to meet these challenges. A number of forces are leading GAO to reevaluate its management approach. GAO's workload is increasing and becoming more analytically and technically complex without an increase in the resources available to meet this workload. Consequently, GAO must comprehensively review its work processes. To fulfill its mission, GAO must become more innovative and perform its work more efficiently.

To achieve this additional innovation and efficiency, GAO will have to consider new practices in quality, productivity, and continuous improvement. In many ways, GAO's management approach can benefit from being rethought using the "total quality management" philosophy that is spreading across the United States. Today, successful organizations using this approach share several characteristics: a pervasive customer orientation; a flat, dynamic organization structure; an obsession with quality; and a management philosophy that builds the self-esteem and dignity of all employees, leading to a full commitment to achieving the organizational mission. GAO has opportunities to assess—and enhance—itsself in all these areas.

This Scoping Study examines the possibilities of adopting a quality management philosophy at GAO that will support the ongoing self-improvement process. This is in accord with the consistently expressed desire of the Comptroller General, who has recognized the need for self-evaluation. In April 1990 he stated that the "demand for our work will continue to grow as the United States finds itself in an increasingly competitive environment. We have to decide where to invest U.S. resources to promote the general welfare of American citizens and our standing among nations. There will be no shortage of challenges in this decade."

Dr. Deming's Visit to GAO

To gain a new perspective on our organization, the Comptroller General recently sponsored a visit to GAO by Dr. W. Edwards Deming, a noted international authority on management. In June 1990 Dr. Deming spoke for several hours to a number of GAO executives and staff. He discussed his management philosophy and introduced his principles concerning quality, productivity, and competitiveness.



W. Edwards Deming with Comptroller General Bowsher and Assistant Comptroller General for Operations Goldstein

Dr. Deming's message, based on 40 years of studying Japanese and U.S. organizations, is that nothing short of a radical transformation is needed in the way organizations are managed:

"We are in a new economic age. We can no longer live with commonly accepted levels of mistakes, defects, material not suited for the job, people on the job that do not know what the job is and are afraid to ask...failure of management to understand their jobs, antiquated methods of training on the job, inadequate and ineffective supervision. We have learned to live in a world of mistakes and defective

products as if they were necessary to life. It is time to adopt a new philosophy in America.”

Dr. Deming’s visit to GAO, as with many of his visits to other organizations—he estimates that he spoke to 80,000 U.S. managers and executives during the 1980s—sparked considerable interest in assessing GAO’s approach to quality and productivity improvement. This Scoping Study is one result of that interest.

Objectives of This Study

This study has three primary objectives:

1. To highlight the philosophies and principles of the leading quality management experts—W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby—and contrast their approaches to achieving quality and productivity;
2. To summarize the experiences of other private- and public-sector organizations that have adopted quality management approaches; and
3. To assess the implications of adopting a quality management approach at GAO and present an implementation strategy, including a discussion of pilot applications that may be required.

Approach and Methodology

To address these objectives, we conducted an extensive review of the current literature in organizational management. We reviewed recent GAO testimony in this area prepared by the Trade, Energy, and Finance (TEF) issue area. We spoke with a number of leading quality management practitioners, both in the consulting area and in quality management offices in leading U.S. companies.

We also engaged McManis Associates, Inc., a firm that has performed strategic planning and other assignments for the White House and many federal departments and agencies, to assist us in preparing this report. McManis and 3M, its subcontractor, have worked for about 25 federal agencies on total quality management engagements under a Federal Supply Schedule contract.

To observe quality management in practice, we visited a number of companies and state and federal agencies recognized for excellent management practices. During these visits we identified the key elements required to develop a quality management culture.

Conclusions in Brief

During our scoping study, we learned that a radical transformation is occurring in the management approaches of progressive organizations. These organizations have committed themselves to understanding and implementing the principles of quality management. As a result, they are receiving numerous tangible and intangible benefits.

Organizations that practice quality management are keenly aware of the expectations of all their customers—external and internal—and they evaluate their performance primarily in terms of satisfying these expectations. These organizations have empowered their work forces to shape their environments and focus on truly value-enhancing activities. They have also abolished many traditional barriers to effectiveness—unnecessary bureaucracy and hierarchy, a focus on results at the expense of improving work processes—and have created flexible environments of continuous learning and self-improvement.

And, perhaps most importantly, most elements of a quality management transformation apply to any organization—private or public. Many of GAO's cultural and historical strengths are conducive to quality management. But some GAO characteristics warrant examination or change in the quest for improved quality. Increased awareness and education can address the aspects that work against a quality management approach. In short, GAO has a clear opportunity to improve its ability to perform its critical mission in an ever more challenging environment.

Principles of Total Quality Management

The concept of producing high-quality products or services is an old one. The quest for quality has been an ongoing theme throughout history. What is new is today's interdisciplinary approach to total quality, which involves consistent performance to customer expectations; internal productivity and teamwork; and cultural commitment to continuous improvement.

History of Quality Management

The understanding of quality that has emerged through the decades has profoundly affected how organizations have been managed. In the late 19th century, the United States broke with European tradition to adopt Frederick Taylor's system of scientific management, which dramatically changed the way organizational processes are viewed and managed. This system separated planning and execution and led to the notion of the professional manager.

Scientific management emphasized productivity at the expense of quality. Taylor's approach crippled the concept of pride in craftsmanship. To build in quality, managers adopted a new strategy: a central inspection department, headed by a chief inspector and production supervisors. An extreme example of this strategy was the Hawthorne Works of Western Electric Company, which at its peak in 1928 employed 40,000 people at the manufacturing plant—5,200 of whom were in the inspection department.

Responsibility for quality became vague and confused. Executive management grew detached from the idea of managing to achieve quality. The general work force had no stake in increasing the quality of its products and services. This was the fundamental approach of U.S. organizations until quite recently.

Impetus for an American Quality Revolution

By the late 1970s, it was evident that the traditional American approach to management was seriously flawed. Between 1978 and 1982, Ford's U.S. sales of cars and trucks fell by 49 percent, resulting in a cumulative operating loss of more than \$3 billion. Xerox, the company that invented dry-paper copying, saw its share of the North American market plunge from 93 to 40 percent during the 1970s. Many other examples of declining U.S. competitiveness existed. Underlying all these cases, however, was the realization that an international quality revolution had arrived and that U.S. companies did not know how to respond.

Traditionally, quality in the United States had been the business of specialists—product specification engineers and process control statisticians—who determined acceptable levels of product variability and performed quality control inspections on the factory floor. In contrast, the total quality revolution of foreign competitors introduced the idea that quality is everyone's business and should be the focus of all significant business processes. This view emphasized listening to, understanding, and satisfying all customers' expectations.

Quality Management Experts

U.S. companies began to seek out quality management experts to try to understand what was happening and to fashion an appropriate response. Three experts were widely regarded as leaders in quality management: W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby. Deming and Juran in particular had consulted extensively with foreign companies—many of whom were making inroads into the American market—after finding U.S. firms uninterested in earlier quality management initiatives.

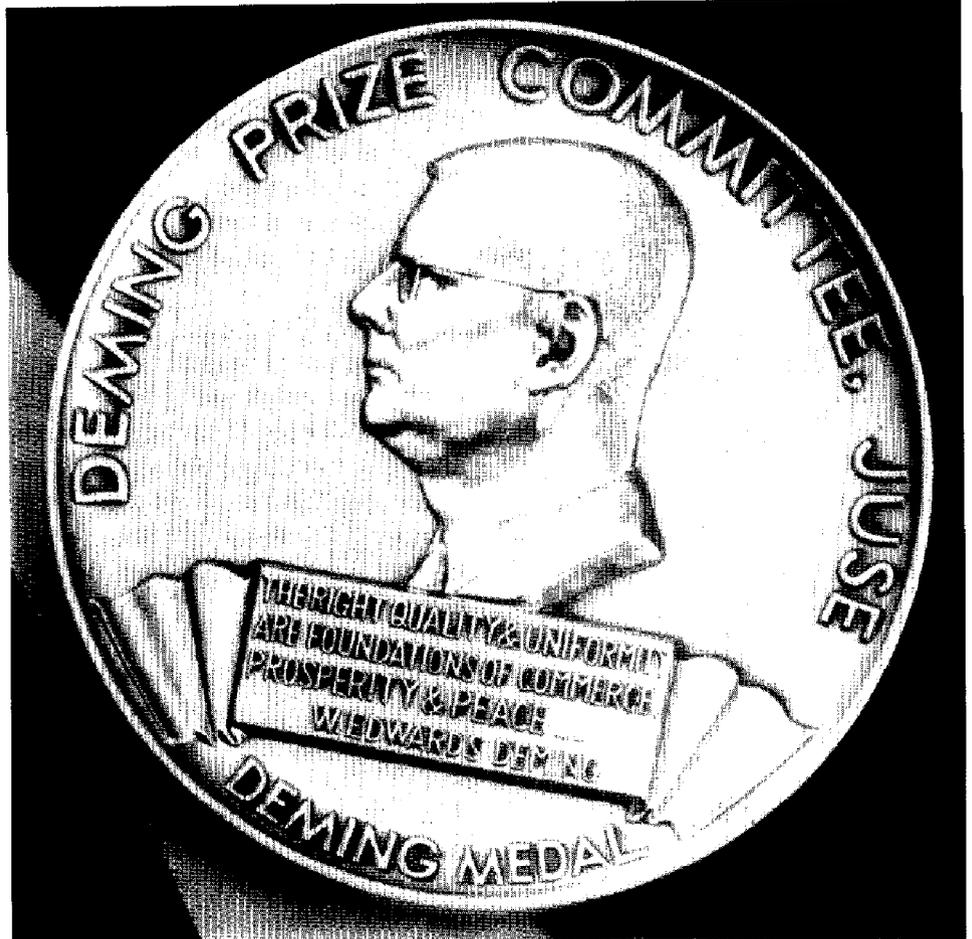
While others have contributed to our understanding of quality management, this study concentrates on the principles and philosophies of these three experts. Brief biographical sketches appear below.

W. Edwards Deming

A worldwide consultant for more than 40 years in quality and productivity improvement, W. Edwards Deming is best known for his work in Japan, where he led a revolution in quality and economic production. He has been referred to as the "genius who revitalized Japanese industry."

In 1980 Dr. Deming's philosophy and principles were the subject of one of the most successful documentaries in television history, "If Japan Can...Why Can't We?" As a result of this exposure and the continuing difficulties of once successful companies, U.S. companies began to consult Dr. Deming.

Today, the Deming Prize, sponsored by the Japanese Union of Scientists and Engineers, is awarded to companies that demonstrate excellence and superior quality throughout their operations. Deming was awarded the Japanese Emperor's Medal in 1960 and the National Medal of Technology by President Reagan in 1987. He has written several books, most recently, *Out of the Crisis*. He earned a doctorate in mathematical physics from Yale and has since received many honorary doctorates.



The Deming Prize

Joseph M. Juran

Like Deming, Joseph Juran had a role in the quality revolution in Japan. Invited to Japan in the early 1950s, he taught the principles of quality management to hundreds of executives. He stressed the need for senior management's active involvement in improving quality.

Before entering quality management consulting, Juran studied electrical engineering and law. He led the inspection control division at Western Electric Company and later taught at New York University. He has written many books on quality and management; Juran on Leadership for Quality is the most recent.

Philip B. Crosby

Philip Crosby, formerly ITT's Director of Quality, runs Philip Crosby Associates in Winter Park, Florida, perhaps the world's best-known

quality management training institute. Crosby pioneered the concept of “zero defects” and has focused on helping managers understand the true costs of unsatisfactory quality. He has written many books on quality.

Key Principles of Quality Management

The quality management experts’ work with U.S. clients revealed a fundamental chasm in the perceptions of quality and productivity. For example, the Honorable John A. Betti, current Under Secretary of Defense for Acquisition, was at one time a senior executive at Ford. He recalls, “I distinctly remember some of Dr. Deming’s first visits to Ford. We wanted to talk about quality, improvement tools, and which programs work. He wanted to talk to us about management, cultural change, and senior management’s vision for the company. It took time for us to understand the profound cultural transformation he was proposing.”

What Deming, Juran, Crosby, and others were proposing was a revolutionary new approach to management that draws on the intrinsic commitment and abilities of everyone in an organization. These practitioners saw quality not as a discrete function but as an elemental part of all business processes—a way of life.

Each expert offered a slightly different view of the key principles of and approaches to quality management. (These viewpoints are summarized in apps. II through IV.) But each practitioner also cited a number of fundamental elements common to all quality management environments.

A Visionary, Committed Leadership Team Willing to Lead the Improvement Effort

The experts all agree that such leadership is the most important element of a quality management environment. Of course, this idea has spread far beyond the traditional quality management school. Tom Peters, in *Thriving on Chaos*, for example, calls for a virtual revolution in the management of U.S. organizations. Leaders, not managers, drive quality management. Too many organizations today are overmanaged and underled. The profound implications of large-scale organizational change make strong leadership a must.

An Organizationwide Understanding of Customer Expectations and a Commitment to Satisfying Them

The adoption of a quality management approach requires redefining all customers, external and internal. Quality management is built on the assumption that everyone in an organization has customers and suppliers. For many employees, a customer may be a fellow employee who is involved in the same business process. Other employees’ customers

are outside the organization. Quality management determines the expectations of all customers—external and internal—and establishes systems to meet these expectations.

Empowerment of Employees at All Levels of the Organization

Employee empowerment is a fundamental attribute of a quality management system. Essential knowledge of business processes resides in employees involved in the processes, and management must create systems that allow these employees to influence the decisions and directions of the organization. Quality is everyone's job, and all employees must feel ownership. Empowerment requires that all members of an organization work together and that a spirit of innovation, risk-taking, and problem-solving be conveyed throughout the organization.

An Understanding That Quality Improvement Is a Continuous, Long-Term Approach to Improving Processes, Products, and Services

Quality management is a never-ending process. Organizations committed to adopting a quality management approach must create flexible systems that can adapt to a changing environment: customers, competitors, processes, and employees all change.

Establishment of Valid Approaches for Measuring Quality

The only way an organization can know if it is meeting quality objectives is through the use of valid measures. Measuring quality supports improvement and provides essential information on progress toward meeting objectives. Where good quality measures exist, good planning follows.

Establishment of Open Communication Channels

Open communication channels are vital to quality management. Too often, bureaucracy, rigidity, and fear block communication. An organization that adopts a quality management approach actively encourages meaningful communication both vertically and horizontally.

Development of a Comprehensive Quality Education and Training Program

All quality management practitioners emphasize the need for comprehensive awareness training for all employees. In addition, specific training should be provided for employees who have key roles in implementing the quality improvement program. Areas of specific training may include work flow analysis, measurement, strategic quality planning, organizational change, facilitation skills, work team skills, and statistical analysis.

Quality Management in Practice

A decade after the introduction of quality management principles in the United States, many private- and public-sector organizations have adopted them to varying degrees. Some of the achievements of these organizations are

- excellent reputations among consumers and industry peers (USAA Insurance Company);
- profitability (3M);
- regaining of market share (Ford, Goodyear, Xerox);
- innovation (Digital, 3M, NASA);
- savings (Defense Industrial Supply Center, Internal Revenue Service); and
- improvements (Naval Sea Systems Command, Internal Revenue Service).

Private-sector U.S. companies, faced with economic uncertainty and intense foreign competition, have generally led their public-sector counterparts in implementing quality management. But even in the private sector, change has been slow. Tom Peters, for example, argues in Thriving on Chaos that “quality is still not often truly at the top of the American corporate agenda.” After presenting his evidence demonstrating the value of quality management practices, Peters asks “...why does all this remain the best-kept secret in North America?”

To determine the status of U.S. quality management programs, we examined the efforts of such programs in a number of companies and agencies. In the private sector, we studied seven companies renowned for their high-quality management practices:

- Ford Motor Company,
- Motorola Corporation,
- Xerox Corporation,
- 3M Company,
- USAA Insurance Company,
- Goodyear Tire & Rubber Company, and
- Digital Equipment Company (DEC).

In the public sector, we studied quality management initiatives in several agencies and subagencies, including

- Office of Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) of the Department of Defense (DOD);
- Naval Sea Systems Command (NAVSEA);
- Internal Revenue Service (IRS), selected service centers;

- San Francisco Regional Administrative Services Center (RASC) of the Department of Health and Human Services (HHS);
- Forest Service of the Department of Agriculture (USDA);
- Division of Engineering Services (DES) of the National Institute of Health (NIH);
- National Aeronautics and Space Administration (NASA), Lewis Research Center;
- International Trade Commission (ITC);
- U.S. Coast Guard; and
- Defense Industrial Supply Center (DISC).

We also reviewed literature on the efforts of many other private- and public-sector organizations, including some in state and local governments. This chapter discusses the lessons learned from these organizations and their implications for GAO and profiles many exemplary quality management efforts. (See app. VI for case study examples.)

Summary of Observations

Based on our study, we have determined that while reservations about the lack of widespread awareness of quality management may be valid, a number of leading-edge organizations have had remarkable success with quality management improvement programs. The perceptions of quality and methods to achieve that quality have changed notably in important sectors of the U.S. economy.

After 30 years, large and small companies are using the teachings of Deming, Juran, Crosby, and other quality experts. The manufacturing sector, under severe pressure from foreign competition, has generally led the way, but many service companies are expanding their efforts. In 1990, for the first time, a service company—Federal Express—has won the Malcolm Baldrige National Quality Award. The Florida Power and Light Company—a public utility—is the only American company to win the Deming Prize for quality. (App. V discusses the key quality awards and criteria used.)

In general, private-sector quality efforts have been considerably more effective than the public-sector efforts cited above. But, in several cases as noted, the public-sector efforts have led to gains in productivity, cost reduction, and employee morale and effectiveness. Public-sector organizations are in a position to learn from the best practices of leading companies.



The Malcolm Baldrige National Quality Award

Organizations that have adopted a quality management approach have a number of common strengths. They are keenly aware of all their customers—external and internal—and they evaluate their business processes primarily in regard to satisfying customer expectations. Employees at these organizations, knowledgeable in quality management principles, assume responsibility to shape their environment, identify the value-added activities, and feel at a personal and professional level that their contributions really impact the organization. The traditional barriers to effectiveness—bureaucracy and hierarchy—are being stripped away and transformed. And, perhaps most importantly, high-quality organizations have created more flexible environments that

emphasize continuous learning and self-improvement so they can respond to ever-changing conditions.

Implications for GAO

For GAO, the key consideration is the extent to which successful applications of quality management principles in other organizations are transferable or relevant. Every organization has a unique culture, environment, and mission. Many quality management successes, however, can apply to GAO.

GAO's challenge is to balance the short-term demands imposed by the Congress with the longer term requirements of a new management philosophy. This entails scanning emerging national issues and building a quality vision. GAO can then develop strategies to effectively deal with both immediate and management issues as it faces more complexity and conflict in a highly competitive global economy. Internally, GAO should examine the value of its multilayered report review processes, its training and certification of staff's management and technical skills, the implications of changing long-standing work processes, and empowering its work force while changing cultural and bureaucratic norms.

Although practical quality improvement has tended to be crisis driven, GAO should not be overly complacent. Once a major crisis is imminent, it becomes extremely difficult to address without multiple adverse consequences and cost to the nation. The challenge for GAO is to seize the initiative and implement a comprehensive self-improvement effort based on the best examples of leading organizations. To facilitate GAO's action in this area, we have summarized the most important lessons learned from other organizations.

Lessons Learned From Private-Sector Quality Efforts

Successful companies integrate the ideas of several quality experts and tailor these ideas to their unique environments.

As detailed in the preceding chapter, although the principles of quality management are fairly uniform among different practitioners, subtle differences exist. The companies we studied evaluated the philosophies of several quality experts before tailoring a set of guiding principles for their unique situations. The executives at different companies all spoke a remarkably similar quality language—"benchmarking, six sigma (3.4 defects per million units), constancy of purpose," and so on—but also said they had spent a lot of time customizing quality. As Deming has

stressed, profound knowledge must be gained from outside the organization, and we found this to be the case. But acting on that knowledge requires a keen awareness of the organization. This is the art of implementing quality management. The following examples illustrate the experience of companies that have done so.

Ford Motor Company

Dr. Deming began working with Ford in the dark days of the early 1980s; his assistance probably had the greatest influence in shaping a total corporate commitment to quality. Former CEO Donald Peterson has publicly attributed most of Ford's success to Dr. Deming. But, while Ford was shaping its "Quality is Job 1" theme, it drew on the skills and ideas of several practitioners. A number of Ford executives were trained at Philip Crosby's Quality College in Winter Park, Florida. Specialists in quality manufacturing worked with Ford in many areas. The company spent more than a year defining and articulating its quality vision and corporate mission. Ford used Deming's foundation but built its own quality structure.

Xerox Corporation

Xerox Corporation was staring into the abyss in the late 1970s, when Japanese copiers of comparable quality were being shipped into this country at a price below Xerox's cost of production.

In 1981 David Kearns, Xerox's CEO, announced a new corporate direction focused totally on improved quality, increased efficiency, and enhanced customer satisfaction. Thus began, as at Ford, a decade-long effort to redefine a major corporation. Xerox, like Ford, considered the ideas of several quality practitioners. Xerox customized its quality approach, however, by incorporating benchmarking into its quality deployment efforts. Xerox identified its most important business processes and compared its performance in these areas with world-class standards. Today, Xerox shares its experience by training executives from leading U.S. companies in benchmarking. Xerox has also, not incidentally, recaptured its leadership in document processing technologies.

DEC

DEC is another company synthesizing the principles of several quality experts to build a unique approach to quality management. Historically among the most profitable of U.S. companies, DEC has recently experienced sluggish growth and declining profitability in the critical North American market. DEC, seeking to avoid the abyss that Ford and Xerox once peered into, has embarked on a massive quality improvement effort. Benefiting from the earlier efforts of other companies, DEC has integrated a range of proven quality management techniques into its program. Cross-functional process improvement teams (a Juran idea),

benchmarking (used at Xerox), and six sigma (used at Motorola) are all elements of DEC's program.

Another key element, however, is strictly home grown. DELTA (DEC Employees Leveraged Team Activities) is a sophisticated, closed-loop suggestion system designed to discover and address problems. Under DELTA, only employees who make a suggestion can dispose of it. They also have the responsibility, however, of working with other employees to either implement or reshape the suggestion or determine that it is infeasible. Thus, DELTA empowers employees and promotes team-building, two essential elements of quality management.

Successful companies are committed to defining the expectations and requirements of external and internal customers.

High-quality companies are keenly aware of who their customers are, what their customers' expectations are, and how well they are meeting these expectations. This applies to external and internal customers. Today, virtually all organizations claim to be close to their customers. High-quality companies go beyond this concept, however, and internalize customer expectations into every significant business process.

Quality management is a never-ending process driven by customer expectations. Peters notes that "even among the best companies, their improvement had not automatically taken them close enough to the customer, especially according to the customers' perceptions of quality." According to 3M Company, quality is "consistent conformance to the customer's expectations."

Examples of companies' efforts that aggressively seek to understand and satisfy external customer demands include the following:

- Goodyear Tire & Rubber established in 1984 a customer support network built around a toll-free 800 number.
- Xerox, using external and internal resources, annually surveys hundreds of thousands of current and potential customers, gauging their perceptions of Xerox's and competitors' products and services. Xerox also has a policy of responding to any written negative comment within 24 hours.
- 3M Company has implemented a sophisticated three-dimensional customer survey approach, complementing internal customer data with that obtained from hand-delivered surveys and focus groups.

- USAA Insurance conducts quarterly customer attitude surveys and benchmarks its service delivery against L.L. Bean.

In addition to the activities described above, high-quality companies integrate the awareness of customers into their culture and daily operations. At Goodyear, every employee carries a credit card-sized mission statement: "Our mission is constant improvement in products and services to meet our customers' needs. This is the only means to business success for Goodyear and prosperity for its investors and employees." At Xerox and DEC, customer satisfaction data obtained through formal customer surveys determines managers' partial compensation. 3M includes customers in certain internal product development meetings.

DEC

The notion of internal customers is also important to many of the companies we examined. For example, as a step in its quality transformation, DEC asked each of its 125,000 employees to answer in writing the following questions:

1. What business processes are you involved in?
2. Who are your customers (that is, the next step in the processes you are involved in)?
3. Who are your suppliers (that is, the preceding step in the processes you are involved in)?
4. Are you meeting the expectations of your customers?
5. Are your suppliers meeting your expectations?
6. How can the processes be simplified and waste eliminated?

DEC told us that this simple survey has had a massive impact. In the short run, countless redundant activities were discovered and eliminated. In the long run, DEC employees now think in terms of meeting internal and external customers' expectations.

Successful companies strive to establish a constancy of purpose in daily activities.

Deming's first and what he considers his most important point of management obligation is to "create constancy of purpose for improvement of product and service with a plan to become competitive and to stay in

business. Decide whom top management is responsible to.” Peters argues that in a high-quality company every employee should be able to articulate the company’s mission in a couple of sentences.

In the companies we examined, we found a consistent effort to define a mission and build constancy of purpose. This mission, focused on customers, enables companies to target their efforts. We found systems adapted to work requirements, not to the needs of the hierarchy. High-quality companies strive to demonstrate constancy.

Examples of companies that have constancy of purpose include

- Motorola, whose employees understand and strive for the six sigma target; and
- 3M, which has established a requirement that 25 percent of each profit center’s sales in a given period must come from products less than 5 years old, institutionalizing the overall company focus on innovation.

Ford Motor Company

Ford spent more than a year defining its mission. Under Secretary of Defense for Acquisition John Betti (former Vice President for Corporate Quality at Ford), says that “there are few these days who will not claim that quality is one of their most important business principles. The real test of commitment to quality comes when there is some immediate pain such as the cost of interrupting production when quality products are not being produced.” Several years ago, Ford withheld releasing a new Thunderbird model, a “sure bet” for Motor Trend’s car of the year, because the car’s quality was not yet suitable for a production model.

Successful companies empower their work forces to achieve organizational objectives.

Empowerment of employees is a consistent theme among the companies we visited. This is illustrated in several ways:

- reduced layers of supervision;
- recognition of employees’ capabilities;
- increased authority and accountability for line employees;
- upward as well as downward communication channels; and
- decreased reliance on traditional, hierarchical organizational structures.

The following paragraphs describe four companies’ successful efforts in this area.

Goodyear Tire & Rubber

Goodyear Tire & Rubber has historically used a traditional management approach. Recent events, however, have led the company toward employee empowerment. A hostile takeover attempt forced Goodyear to assume dangerous levels of long-term corporate debt and to sell several large, non-tire divisions. Two foreign-owned companies, Michelin and Bridgestone, acquired B.F. Goodrich and Firestone, respectively—Goodyear's largest U.S. competitors.

Goodyear realized it had to adopt a more flexible management style to adapt to its radically changed environment. Increased empowerment was one method. Another was to use salaried workers operating under minimal supervision to staff new, state-of-the-art manufacturing facilities. Layers of management have been trimmed. In unionized plants, joint management-union problem-solving teams have been established. As one executive told us, "all our people read the paper and know what is going on out there. They are now committed to working together."

3M Company

3M has built empowerment into its management incentive systems. Divisional managers are given key financial targets and permission to shape their own strategies for hitting those targets.

Milliken

Milliken, another Baldrige Award winner recognized for its quality management approach, uses an employee suggestion system (used as a model by other companies) to empower its work force. Milliken responds to all suggestions within 48 hours and works with the suggestors to shape and implement valid suggestions as soon as practicable. Employees quickly see the fruits of their creativity.

Motorola

Motorola strives continually to encourage decision-making by first-line employees. Motorola complements this effort with a comprehensive educational effort designed to "breathe the very spirit of creativity and flexibility into manufacturing and management." In its early empowerment efforts, Motorola realized it was asking its work force to undertake new responsibilities without giving them adequate skills and knowledge. Today, Motorola is recognized for "Motorola University," a \$120 million annual investment in improving the skills of its work force.

Successful companies are driven by vision and strong leadership—a future orientation.

Ultimately, strong visionary leaders are the most important element of a quality management approach. Donald Peterson at Ford, Robert Galvin at Motorola, David Kearns at Xerox, Kenneth Olsen at DEC—all led

quality management efforts. Tom Peters outlines 12 attributes of a quality revolution. His first attribute? "First comes management's attention—or obsession, as I prefer to call it. What does that mean? It's visceral...it is essential to begin with emotion. Quality begins precisely with emotional attachment, no ifs, ands, or buts."

In all the companies reviewed, we found leaders willing to shatter existing paradigms, and to "walk the talk." Artificial barriers between divisions and levels of hierarchy were abolished. "Outrageous" goals were established (for example, six sigma at Motorola) to force organizations to think in new ways. Senior executives taught quality management principles to their employees. Cross-functional quality improvement teams reported directly to senior executive management. Quality objectives were written into business plans and mission statements. The vigorous support of senior management for these efforts was constant.

Lessons Learned From Public-Sector Quality Efforts

Successful agencies are redefining their customers and identifying requirements.

The role of government is changing due to shifts in national priorities, deregulation, and budget constraints. In this climate, successful agencies are reexamining their customer bases to determine whom they are really serving, their customers' requirements, and whether the agency's products continue to serve them well.

NASA's Lewis Research Center, the IRS Federal Tax Deposit (FTD) System, and NAVSEA conducted assessments of their customers through interviews, surveys, and representative customer focus groups. All have realized the importance of customer involvement and input and saved significantly in money and manpower. Profiles of other agencies that are examining their customer bases follow.

CHAMPUS of the Department of Defense

CHAMPUS recently conducted a customer analysis in response to the 800,000 inquiries and complaints it receives each year. It found that its employees did not recognize a half dozen customer groups. CHAMPUS employees often recognized only their immediate customer as their only customer but are now beginning to understand that total quality means meeting the realistic needs of all customers in order of priority. CHAMPUS has extended this customer awareness philosophy to its vendors, the major insurance companies that process its health care claims. It is considering making total quality management (TQM) mandatory for all its

vendors and including customer satisfaction indicators as performance criteria in its contracts.

U.S. Coast Guard

The U.S. Coast Guard just completed a survey of its entire membership to assess the quality of health care it provides to members and their families. The results of the survey, which showed a 30 percent dissatisfaction level with the quality and accessibility of medical treatment, are being used to develop new Coast Guard policies and medical practices and procedures. The Coast Guard is using TQM tools, such as statistical process control (SPC) and Pareto analyses (see the glossary in app. VIII), to improve the quality of its health clinic operations.

Madison, Wisconsin

Madison, Wisconsin, launched a communitywide effort to improve quality in both the business and government sectors. The city's Motor Equipment Division conducted one of the first such efforts, and it focused on identifying customers' problems and improving service, cutting turnaround time on repairs from more than 9 days to about 2.5 days. Philadelphia is conducting a similar communitywide quality improvement program.

Successful agencies develop quality visions.

A basic tenet of management science is that, without a plan, any path will do. Many agencies, in today's volatile government environment, want to shift from being crisis driven to a proactive stance. Many successful agencies are conducting strategic planning and translating future requirements into vision statements. Vision statements serve a number of purposes; specifically, they

- crystalize an agency's purpose and responsibilities for customer quality and the quality of its employees' work environment;
- communicate the organization's goals and future agenda to employees, promoting ownership at all levels; and
- enable progressive executives to lead their agencies, avoiding the plight of many traditional organizations, which are often overmanaged but underled.

The NASA Lewis Research Center, the USDA Forest Service, and the IRS have strongly committed to strategic planning and have a vision focused on quality. The Forest Service initiated a 5-year strategic plan for piloting the new management philosophy, with a long-term goal of

implementing quality principles organizationwide. The IRS uses a decentralized approach because of the organization's size. But the IRS Commissioner communicates to the work force commitment to planning and a quality vision. Profiles of other agencies that are developing quality visions follow.

RASC of the Department of
Health and Human Services

The RASC of the Department of Health and Human Services recently launched a strategic planning process to enhance the quality of its services. The process started with the development of a quality vision that identified customers and their requirements. Based on this vision, the RASC identified internal customers and teamwork requirements; established goals for enhancing existing financial, personnel, and administration services; and developed an action plan.

David Taylor Research Center of
the U.S. Navy

The Navy's David Taylor Research Center has launched a major strategic planning initiative. The center consists of 2,800 employees in 6 engineering laboratory detachments that serve different customer bases and operate semiautonomously. To create a more cohesive organization, establish cross-cutting management priorities, and optimize the use of scarce resources, the commanding officer has established a quality vision and implementation plan.

The plan, which is nearly in place, has trained facilitators, established cross-functional problem-solving teams, and trained mid-level managers in TQM. Specific outcomes at the Center include greater communications among departments, a sense of common ownership, and a long-term perspective by the managers. In commenting on these accomplishments, a department official stated, "TQM has been the methodology that helped us accept the pain that is inevitable in such a dramatic direction change."

Successful agencies empower their employees.

The rigid organization structures and compartmentalization of work in federal agencies deprives managers and employees of power. This stifles creativity, initiative, and productivity; in addition, it often diverts the agency from customer service issues to issues of internal turf, conflicting priorities, and parochialism.

Successful agencies counter this tendency with concerted efforts to empower managers and employees. Greater delegation of authority, organizational streamlining, and simplification of work procedures achieve this.

By empowering their employees, the Forest Service, the DISC, and NASA's Johnson Space Center have improved not only quality, but employee morale and commitment to organizational goals. When allowed to participate in decision-making and given greater authority, employees have demonstrated a desire to help solve the problems of the organization. Other examples follow.

USDA Forest Service

The Forest Service has been a leader in this regard by advocating that its people serve customers directly rather than "hide behind policies." It has delegated considerable lump-sum budget authority to national forest managers and simplified many of its administrative regulations. The Forest Service is delivering TQM awareness and facilitator training to personnel in regional offices across the country.

Social Security Administration
(SSA)

Another agency focusing on cultural change through employee empowerment is the Social Security Administration. The Commissioner has established quality service to beneficiaries as a major priority. Recognizing local differences in the beneficiary populations served and in SSA offices serving them, SSA has delegated substantial lump-sum budget and management authorities to local directors and managers. Ten offices are conducting pilot programs, which are supplemented with quality awareness training.

State of Minnesota

In Minnesota, the Strive for Excellence in Performance (STEP) program has called upon all state employees to contribute their advice and insights on quality and productivity improvements. Similar efforts have been undertaken at the agency level in other states, such as Maryland and Wisconsin.

Successful agencies use comprehensive quality management to realize continuous improvements.

Several progressively managed agencies are using comprehensive quality management to realize continuous improvements in products and work processes. These agencies do not have mandates for change but nevertheless recognize that today's procedures may not necessarily be the formula for tomorrow. A typical comment of top executives in these organizations is, "today we are playing baseball but tomorrow's game may be football—new rules and demands for teamwork will govern us."

Some noteworthy agencies that have successfully focused on constantly improving their products and processes are the IRS (FTD System), NAVSEA, and DISC. Other examples follow.

International Trade Commission

The ITC is similar to GAO in that its major products are congressional reports and testimony. It started a TQM approach for the continuous improvement of its financial and administrative services. The office of administration, which supports report preparation, has an impressive customer service record but nevertheless wants to improve. It has conducted an external environmental assessment of issues confronting ITC, inventoried its internal customers, established a 20-member quality council, conducted quality awareness training, and identified process action teams.

Division of Engineering Services (DES) Of the National Institutes of Health

The Division of Engineering Services of the National Institutes of Health, which is responsible for the facility planning, construction, and maintenance of NIH, has also undertaken a continuous quality improvement effort, primarily to improve the quality of services delivered through approximately 40,000 work orders each year. While NIH programs are expanding and the number of laboratories increasing, administrative budgets and the number of support personnel are static. DES believes that through continuous quality improvements, it can accommodate future customer needs.

DES's continuous quality improvement efforts are helping it structure work processes in a way that most closely parallels customer interface requirements. Its planning process for continuous quality improvement started with quality awareness training and the development of critical success factors (CSFs) for DES. From the CSFs, DES redefined and integrated its functional work processes and assigned key action areas to division managers. DES is currently using TQM tools, such as Pareto analysis and value chain analysis, to help improve work processes.

Quality Management Implementation Issues at GAO

GAO's work environment is rapidly changing, requiring corresponding cultural changes. The major policy and program challenges facing the nation and the government increasingly drive our workload, with Congressional requests accounting for most of our evaluative work. In addition, the workload is increasing without increased resources or significantly more time to do the work. Indeed, the Comptroller General announced in April 1990 the need for GAO to do a better job of establishing work priorities.

GAO is also seeking a more aggressive role in shaping national policy. The Comptroller General, through publications like *Facing Facts* and the *Transition Reports*, is positioning GAO as a major contributor to various public policy issues while the country is facing the implications of several faulty national policies.

Based on our study, we believe the adoption of a quality management philosophy at GAO is the best guarantee that the agency will be able to respond to this challenging new environment. The principles of quality management—enhanced leadership, flatter organizations, empowered and trained employees, increased customer focus, measured quality, improved communications—are designed to make an organization more flexible, more efficient, and better able to use its full range of internal resources.

Impact of GAO's Internal Environment on Quality Management

Organizational change is possible only if grounded in a thorough understanding of the present environment. Certain of GAO's organizational attributes will affect its ability to make the cultural changes required to implement quality management. Some attributes are conducive to quality management and some are averse to it. The following discussion of these attributes is based largely on informal interviews with staff at all levels both in the division and staff offices. (As will be discussed later, a cultural values survey is useful to formally assessing an organization's culture. We recommend using such a survey to illuminate further the major cultural issues facing GAO.)

GAO Attributes Conducive to Quality Management

Continuity of GAO's Executive Leadership

Quality management requires a long-term commitment. GAO, due to the continuity and apolitical nature of its senior management, is able to

GAO's Historical Emphasis on
Quality and Operational
Improvements

make such a commitment. Quality management practitioners often cite the political turnover in government agencies as a primary deterrent to the success of quality management in the public sector. GAO can adopt a long-term strategic outlook, largely unencumbered by short-term political interference.

The importance of delivering a high-quality product is ingrained in the GAO culture. Quality management would refine GAO's understanding of quality—satisfying customer expectations—and its methods of building it into GAO's processes. Because GAO already thinks in quality terms, its environment is conducive to this idea.

The notion of continuous incremental improvement, another general tenet of quality management, also agrees with existing initiatives at GAO. In the last 10 years, GAO has started many operational improvement efforts, although in many cases they have not realized their full potential. The existence of such efforts has created a culture, however, conducive to change at the operational level.

Skill and Loyalty of GAO's Work
Force to the Operational Mission

Most people recognize that GAO is one of the premier places to work in the federal government. GAO hires selectively—generally, less than 5 percent of the more than 6,000 yearly applicants—and offers a challenging intellectual environment for its work force. GAO employees are skilled and loyal to the organization. This creates an atmosphere conducive to quality management for two reasons:

- GAO employees tend to see GAO as an attractive career choice, which makes them willing to go along with a long-term cultural change effort; and
- newer GAO employees, most possessing nontraditional (that is, nonaccounting) backgrounds, can be catalysts for change. Organizational change is required to accommodate the new GAO work force, if for no other reason.

GAO Employees' Familiarity
With Small, Cross-Functional
Teams

GAO evaluators customarily work in small teams during the course of a project. They also draw on the expertise of colleagues in other functional areas or in different regions. Consequently, they are well suited to adapting to the small, cross-functional process improvement teams that most practitioners recommend for implementing a quality management approach.

Significant Cultural Changes
Occurring During the Tenure of
the Current Comptroller General

During the current Comptroller General's tenure, several systemic and cultural changes have occurred. These changes—in hiring, training, organizational structure, compensation, broad banding, report processing, and so on—have reinforced the notion that change is possible. In effect, a groundwork for large-scale cultural change is already in place. Quality management would build on these diverse efforts, unifying them under the umbrella of a more focused, customer-oriented, long-term approach to our work.

GAO Attributes Averse to
Quality Management

Excessive Layers of Hierarchy
and Review

Empowerment is the essence of every successful quality management implementation. Organizations in both the private and public sectors are radically changing their traditional approaches toward human resource management. The rigid, top-down organization is becoming obsolete.

At GAO, however, several trends are working against empowerment of the work force:

- Attempts to build in quality at the end of the report development process through excessive post-evaluation review reduce accountability and pride of workmanship among the report preparers.
- Traditional staffing and organizational constraints leave employees with significant unproductive time, which erodes pride and self-esteem.
- Evaluating employees on the basis of measurable output makes them focus on production to the exclusion of value-enhancing analysis and team building, which ultimately erodes their confidence in the organization. The true dimensions of someone's contribution—analyzing, thinking, motivating others—are often unknowable and unmeasurable.

The energies and abilities of GAO's people are its core strength. To the extent that a sense of disempowerment leads to alienation or disenchantment of the work force, GAO is failing to achieve its organizational potential.

Insufficient Upward Flow of
Information

Formal and informal barriers can inhibit the flow of information within organizations. Organizations that have adopted a quality management philosophy strive to abolish these barriers. In particular, these organizations encourage a healthy flow of information up the organizational structure, recognizing that employees closest to the customers and work

processes are the best source of ideas to improve quality and productivity. One company uses the phrase “every problem is a treasure.” This captures the notion that it is only through discovering and addressing problems that an organization improves itself. In such an environment, employees perceive an opportunity to influence decisions that will directly affect them. This openness is manifested through such practices as allowing employees to contribute to their supervisors’ performance evaluations and maintaining an effective employee suggestion system. A strong upward flow of information empowers employees.

A healthy internal information flow is hard to quantify. Practitioners describe this variously as “breaking down barriers between departments” (Deming) and “communicating results” and “building awareness” (Juran). Many of the strongest barriers to an effective information flow are informal, related to an organization’s culture and past practices.

At GAO, a strong perception exists among some employees that they cannot influence the organizational policies that directly affect them. This perception exacerbates the disempowerment felt by GAO employees.

GAO’s Cultural Obstacles to Technicians Becoming Managers

Generally, as employees move up in an organization, they spend an increasing amount of time on traditional managerial tasks—planning, directing, and controlling the deployment of resources—and less time on the technical requirements of their operations. At GAO, however, the technical demands remain great on managers, who may have to testify or otherwise demonstrate technical mastery of their issue areas. Consequently, managers have a hard time moving from technician to manager. The adoption of a quality management approach at GAO requires a keen focus on the art of management. Managers who are too busy “fighting fires,” especially those of a technical nature, may not be able to commit the time and attention required to understand and guide the organizational shift to a quality management culture.

GAO’s Inability to Satisfy the Demands of Its Congressional Customers

Quality management involves getting close to customers, anticipating their needs, and satisfying their expectations. GAO, as a nonpartisan agency working in a politically charged environment, cannot always provide the answers its congressional customers want. Under a quality management approach, GAO would strive to improve its understanding of who its customers are, what their requirements are, and if necessary work with these customers to shape their expectations. Virtually all definitions of quality at the companies we examined refer to customers’ expectations and perceptions. GAO will also ultimately have to define

quality based on the view of its customers, which may require a significant change in the way it sees itself.

Extensive Regional Structure

About 40 percent of all GAO employees work outside of headquarters, complicating efforts to implement a quality management system at GAO. But a regional structure does not preclude a successful implementation. The companies we reviewed all have international operations and have nonetheless implemented a quality management philosophy on a companywide basis.

Cultural Change Needed

GAO's culture is based on the accounting and auditing disciplines and has evolved for many years. Most of GAO's newer employees, however, have different training and attitudes. GAO must integrate and change these cultures to meet the new challenges. The following table illustrates suggested cultural changes.

Table 1: Suggested Cultural Changes

From	To
Hierarchical style	Participative style
Achieving quality through inspection	Building quality into the process
Top-down information flow	Top-down, lateral, and upward information flow
Inward focus on quality	Customer-defined quality
Intuitive and subjective plans and assessments	Planning based on validated measures of quality
Short-term planning	A vision for the future
Competition among divisions and between headquarters and the field	One team pulling together
Episodic improvements	Comprehensive and continuous improvements
Top-down initiatives	All staff involved and engaged

GAO Quality Management Implementation Strategy

No single formula can successfully implement quality management in all organizations. The best plan tailors an implementation strategy to the individual organization. Quality management requires more than training; it is a full-scale redirection of an organization's focus.

Instead of sporadic productivity improvements mandated by top management, quality management involves every employee's taking responsibility for meeting the needs of external and internal customers.

Implementing quality management requires a total commitment from the top levels of an organization and total acceptance from the lowest levels. It calls for a clearly defined action plan and the development of technical expertise in the organization to facilitate the change. And the change will happen only to the extent that managers in the organization are willing and able to set the example for open communication, participative planning, and decision-making based on statistical process analysis.

A few basic approaches should be part of any implementation strategy:

- initial quality assessment,
- top-level management awareness training,
- formation of a quality council,
- establishment of a participative environment that fosters teamwork,
- development of prototypes,
- celebration of successes in meeting quality objectives,
- organizationwide implementation, and
- annual quality review.

This chapter discusses these approaches as applied to GAO quality management efforts.

Initial Quality Assessment

The main function of the initial quality assessment is to create awareness of the need to revitalize GAO's culture. This assessment includes evaluation of data from a variety of sources but is mainly related to the perceptions of GAO's customers.

Before collecting specific data, GAO must identify its customers. As stated in an April 11, 1990, memo from the Comptroller General, GAO must recognize multiple external customers and establish priorities to better meet customers' needs. GAO must also develop the notion of treating others in the agency as internal customers.

The criteria on which to assess the data are the quality of GAO products and services as perceived by customers, the timeliness and responsiveness of those products, and the costs of GAO products.

One aspect of cost is the cost of quality or how much time and money is used to achieve the desired quality. “Cost of quality” is a term frequently used by quality management practitioners to refer to the hidden costs caused by poor quality:

- multiple reviews,
- rewrites,
- recycling of changes back to reviewers, and
- lost hours that could have been applied to other projects.

These costs decrease as quality is increased.

GAO must also conduct a cultural values survey as part of the initial quality assessment. This survey would extract and compare the various perceptions of GAO’s culture held by employees throughout the organization.

Interviews of external customers will reveal their perceptions of GAO. This assessment should also address quality management issues raised.

Top-Level Management Awareness Training

Awareness training should stress the relevance of quality management for GAO by using the results of the initial quality assessment as a catalyst for discussion.

All GAO senior executives should receive awareness training, which introduces the philosophy of quality management and suggests techniques for its implementation. Management must understand that quality management is a philosophy or an approach to management—not a program.

Formation of a Quality Council

After awareness training is completed, GAO should form a quality council consisting of top management and employees from all levels of GAO who are interested in and knowledgeable of the principles of quality management. This council, which will be responsible for the long-term implementation of a quality management approach, should report directly to the Comptroller General. In particular, the council should coordinate

training, monitor and support prototypes, and study other organizations' approaches to determine the most successful practices.

The quality council should demonstrate a commitment to excellence in the way it conducts its business to set an example for the rest of the organization. The council should also demonstrate participative planning, open communication, and analytical problem solving. GAO divisions, regions, and staff offices can also establish quality councils.

Team Building

In the 1950s Professor Eric Trist coined the term "socio-technical systems" to describe the patterns and systems of human interaction necessary to carry out any complex task in an organization. The principal finding of his work at the Tavistock Institute in England was that these systems of human interaction must be developed just as carefully as the technical or mechanical aspects if the system is to operate effectively. In quality management terms, employee involvement and team building are essential for successfully implementing quality management and should be carefully designed into every aspect of the strategy.

Prototype Quality Initiatives

John Adams and other practitioners of change management contend that only 25 percent of the people in a typical organization are willing to experiment with new ways of doing things. Another 50 percent will watch to see which way the wind is blowing before joining in, and the remaining 25 percent will remain resistant to the end.

Prototype or pilot efforts are one way of dealing with this aspect of organizational life in America when attempting to introduce major changes. In recent years both private- and public-sector organizations have succeeded in demonstrating the practical value of new ways of organizing work with highly visible prototype quality and productivity initiatives. Successful prototypes come close to offering the thoroughly tested and proven innovations demanded by more cautious people in an organization.

The quality council at GAO might stimulate the development of several prototype quality management efforts in the following ways:

- After completion of quality awareness training, some of the managers of program divisions, technical divisions, field offices, and support functions would be able to volunteer to have their organizations selected for a prototype TQM effort.

- Interested managers would be able to apply for early prototypes to address a particular problem, issue, or work process in their organizations, or individual managers might describe a cross-functional process in which their organization is one of the key players. A special evaluation team from the quality council would visit managers who apply and evaluate the applicant organization according to predetermined criteria.
- The quality council would select several prototypes from among the applicant organizations and might also select one important cross-functional process that seems to have support from several key managers whose organizations are involved. Establishing selection criteria might involve asking some of the following questions:
 - Is this an important strategic quality issue?
 - Can GAO anticipate a payoff to justify the resources invested in this project?
 - Does this have the support of GAO's top management?
 - What is the likelihood of early success for this prototype?

Steps to implement the prototypes should be the same as those used in the overall quality management effort:

- awareness training, including some basic analytical tools and techniques;
- selection of specific quality management objectives;
- analysis of the existing process;
- establishment of measurement standards;
- implementation of a model for continuous improvement, such as the Deming "Plan-Do-Check-Act" cycle; and
- benchmarking to establish interim goals for performance.

Celebration of Successes

GAO should widely publicize successes achieved by prototype organizations. This will help to encourage those units that are in the early stages of implementing quality management and should help to satisfy those who said, "It can't be done here." Recognition and celebration of successful quality improvements are essential to quality management efforts. Such recognition not only credits and rewards the people involved but also reinforces the organization's commitment to quality principles.

Recognition should be given primarily at the group or team level, demonstrating that quality management is a team effort. Of course, citing

individuals is also appropriate, and this can be done under existing programs or in special recognition of those who make notable quality improvement contributions. Individual recognition, however, should not detract from quality team efforts.

Annual Quality Review

The annual quality review is an effective technique for implementing the quality management process throughout an organization. A customized interview process and rating system, this review is designed to examine how well quality management principles are implemented throughout an organization.

One possible approach at GAO would be to use the criteria established for the Malcolm Baldrige National Quality Award to determine how well GAO has adopted quality management principles. Knowledgeable and objective individuals who can bring an outside perspective to the effort should conduct a self-initiated diagnostic process. Other organizations have found such a technique to be invaluable in assessing their quality management implementation.

Another possibility for GAO would be to apply for the President's Award for Quality and Productivity. This award is based on criteria similar to the Baldrige Award. (See app. V for further descriptions of national quality awards.)

Proposed First-Year Steps to Implementing Quality Management at GAO

As discussed in the previous chapters, American industry and more recently government entities have dramatically improved their performance through a focus on customer service and employee empowerment. Increased quality management efforts by federal agencies and the recent Deming visit to GAO have stimulated much interest in quality improvement at GAO. The time appears right for GAO to adopt a major quality management strategy to help it carry out its responsibilities more effectively and keep the agency in the forefront of federal management improvement efforts.

Ultimately, all GAO employees will have a role in implementing quality management at GAO. The following proposed work plan, however, lays out the initial steps toward implementing quality management, most of which are directed to senior GAO management. Full implementation involving all employees will take place during several years. Total quality is a never-ending journey toward continuous improvement.

Comptroller General Leadership

Comptroller General leadership is essential for GAO to implement a successful quality management improvement effort. The Comptroller General should not only support quality management but direct the implementation personally. This will require a familiarity with the principles of quality management and a willingness to persuade GAO personnel to adopt quality management principles and practices.

The Comptroller General has already taken the first steps. (See app. IX for a copy of a memo written by the Comptroller General on guidelines for setting work priorities.) We recommend, however, that he take the following additional steps:

- participate in a quality management CEO awareness program, such as the “World Class” course conducted by the 3M Company; and
- visit additional public- or private-sector organizations that have successfully implemented quality management.

These steps should be taken within the first 60 days of the process.

Establishment of a Quality Council

GAO can achieve quality management only through the full participation and involvement of all employees. Overall guidance and coordination of the effort should be the responsibility of a GAO quality council; the Comptroller General should appoint GAO employees to the council.

One of the council's early tasks would be approving prototype applications of quality management. We have already identified two prototypes as candidates, but their selection should be made after the steps above are carried out to ensure that they will suit the strategy and plan for implementing quality management in GAO.

This should take place within the first 90 days of the process.

Awareness Training

GAO top management must understand the theory, principles, and practices of quality management to get the quality improvement process underway. This can best be achieved by providing awareness training for about 15 top managers, including all Assistant Comptrollers General and other top officials.

This should be done during the third and fourth months of the process.

Approval for implementing a total quality management philosophy and principles should be made at this time or when awareness training is completed for top officials.

Development of a Vision for GAO

The Comptroller General's guidelines of April 11, 1990, are a good start toward developing a vision statement for GAO. The vision statement should be based upon a review of our customers' needs and should give some general priorities for meeting those needs.

It should describe the GAO of the future and inspire action toward realizing the new vision. It should address the role of the major components of GAO, including headquarters, regional offices, and staff functions.

The vision statement should be reviewed at a management workshop, after which the statement should be widely circulated for comment. After a statement is adopted, it should be disseminated to all GAO personnel. The vision should then be translated into a set of time-phased 5-year objectives for the agency.

This should be accomplished during the fourth and fifth months of the process.

Training for the Quality Council

The quality council needs expertise in the practice and theory of quality management. Council members, as well as other employees helping to facilitate implementation, should be trained in techniques and applications. This training may include an introduction to using statistical process controls, Pareto analysis, flow charting, cause-and-effect diagrams, and effective team-building techniques.

Team building is a hallmark of quality management. The quality council should include that objective in its planning. Its own performance can serve as a role model for the agency.

This should be done during the fifth through seventh months of the process.

Development of the GAO-Wide Quality Plan

The quality council should develop a quality plan, which should establish implementation milestones and include comprehensive quality assessment and organizationwide and training-related changes.

Comprehensive quality assessment involves

- identifying GAO's various customers and their needs,
- assessing the attitudes of GAO staff and relationships among major units, and
- assessing the quality of GAO's products and services, taking into account the new perceptions about customers' needs; this is the starting point for designing quality improvements.

Organizationwide changes involve

- establishing cross-functional quality improvement teams for groups selected for prototype applications and ongoing improvements for which a need is revealed,
- implementing annual quality reviews, and
- developing/acquiring technical resources or expertise. Training-related change involves
- preparing a "blueprint" for quality management training, for example, skills for personnel in prototype groups and quality management awareness training for all personnel;
- preparing training materials that reflect techniques and approaches to process improvements, such as Deming's "Plan-Do-Check-Act" model for process improvement; and

- providing critical management and technical training identified by quality improvement teams.

This step should begin once the approval to implement total quality management has been given. It should be completed between the eighth and tenth month of the process.

Guidelines for developing a GAO-wide quality implementation plan should parallel the criteria for the Malcolm Baldrige Award.

Summary

There are critical steps to be taken in the first year that will largely determine whether GAO will successfully continue and adopt a quality management philosophy. These include

- the quality assessment,
- the setting of priorities,
- equipping staff and organizational units to carry out the work,
- changing the ways work is performed, and
- evaluating results to see if objectives have been met.

Quality management in both the public and private sectors has resulted in significant improvements in quality and employee morale. In addition, there have often been dramatic cost savings that have more than offset the initial investment required to implement quality management.

In Dr. Deming's words, this is a "win-win" situation.

Chapter 6
Proposed First-Year Steps to Implementing
Quality Management at GAO

Dr. Deming's GAO Presentation

This appendix summarizes the key points of Dr. W. Edwards Deming's lecture given at GAO on the morning of June 9, 1990.

Background

Eighty-nine years young, Dr. Deming is perhaps the most widely recognized management expert in the world. In Japan the most prestigious award a company can win is the Deming Prize, awarded only after a company's practices and methods are rigorously studied for many years by a team of examiners. Although Dr. Deming is perhaps best known for his development of statistical quality control measures to improve manufacturing operations, his overarching philosophy is that all organizations need to do a much better job of managing people. Dr. Deming's humanistic vision is that people have intrinsic strengths and values—self-esteem, enthusiasm, a willingness to learn—but that organizations in general have adopted practices that crush these attributes to the detriment of organizations and society at large.

Dr. Deming first made his mark in Japan in the late 1940s. After being rebuffed in his efforts to work with American firms to improve the quality of their products, Dr. Deming traveled to Japan to assist the post-war recovery efforts. U.S. firms at the time were expanding in markets and worldwide dominance and did not see the need to improve their operations. His ideas met a ready audience in Japan, and in the close-knit Japanese industrial community, his ideas quickly spread. Through the Japanese Union of Scientists and Engineers, Dr. Deming gained a platform for delivering a basic message: by focusing on and consistently improving the quality of their manufactured products, the Japanese could eventually achieve world-class status.

Forty years later, it is the United States that needs to learn Dr. Deming's lessons. But today his message has broadened. Dr. Deming's lessons are as much about how to relate to other people as they are about business management. Dr. Deming's favorite saying, "there's no substitute for knowledge," highlights his key point: we are being undercut by best efforts conducted in the absence of a firm knowledge base. He sees pervasive ignorance in the way employees and managers relate to each other, and he has now dedicated his life to teaching his lessons.

Key Points

Following are the key points of Dr. Deming's lecture:

- Dr. Deming began by asking where quality originates. Needless to say, it is not on the shop floor. Quality originates in the boardroom, as does failure. He noted that “banks don’t fail because a teller fills out a form improperly. They fail because of bad management decisions.” Dr. Deming stated that the systems put into place by management determine the quality of an organization’s performance.
- Dr. Deming said several times, “we are being ruined by best efforts.” He argued that there is no substitute for knowledge and that this knowledge must come from the outside. Dr. Deming noted, “I learned so much in the last week that it would take me hours to write it all down” and emphasized the need for maintaining openness to new ideas and techniques.
- Dr. Deming said that the size of an organization is irrelevant to its creative capacity. He cited Bell Labs as an example of a creative monopoly and said that the true determinant of creativity is “the freedom that people have to create things.” Managers in all organizations can provide this freedom.
- Dr. Deming criticized managers who spend their time “stamping out fires, but never improving things.” He described the approach of many managers who use measures of past performance to guide their decisions as “driving a car by looking only at the rear view mirror.”
- On at least three occasions, Dr. Deming eviscerated the concept of annual appraisals and performance-rating systems. He dismissed annual appraisals as “nonsense,” noting that variation is inevitable, and added, “you can only measure the unimportant.” He described appraisal systems as “destroyers of people.” Dr. Deming argued, “everything should be measured by its contribution to the system.” He compared organizations to orchestras and pointed out the chaos that would result if individual performance was stressed in a 130-piece orchestra.

Dr. Deming attributed the use of appraisal systems to a pervasive ignorance of statistical variation. In a nutshell, his philosophy is that the use of any one indicator to measure performance would be as meaningful as, for example, ranking a work force according to height and that management’s persistent efforts should be directed at improving the system to enhance everyone’s efforts. At one point in his discussion, Dr. Deming noted, “if there is one word that I can barely utter, it is ‘ranking.’ Why create an artificial shortage of winners?”

- Dr. Deming noted, “perhaps 2 of every 100 managers and 12 of every 100 employees,” are happy at work. He asked rhetorically, “How are we doing?” and then pointed out that his Japanese-made microphone,

which "contains 18 cents worth of American-made raw materials, probably cost GAO \$2,000 or maybe \$1,800 on sale." Dr. Deming argued, "we have an obligation to improve the way we do things." His recommended solution is to improve our knowledge about optimizing systems. He consistently returned to the need to improve our system of management. "Only foolishness and ignorance holds us back," he said.

- Returning to appraisal systems, Dr. Deming challenged GAO. "You are the General Accounting Office, so tell me, where do you record the costs of your appraisal system? Where do you record the losses?" He continued by noting that the most important figures are never on the balance sheet. The most important figures are unknowable. Dr. Deming added that he would refuse to refine instruments of measure, implicitly setting the process on a higher conceptual plane.
- Dr. Deming outlined his "System of Profound Knowledge for Management in Industry, Education, and Government." He described this system as the interdependent mastery and usage of four activities:
 - Develop an appreciation for the importance of having a system in place.
 - Develop an understanding of the theory of variation.
 - Develop a practical theory of acquiring and using knowledge gained from outside sources.
 - Develop an understanding of psychology.

He asked and then answered his own rhetorical question: "Is gaining the knowledge of variation difficult? Nonsense."

- Dr. Deming was sharply critical of the government's mismanagement of its relationship with business. He views deregulation and blind faith on competition as "pure nonsense" and asked the audience, "How many different airlines fly from Washington, D.C., to Detroit. One. St. Louis? One. What are you doing about this?" He described the deregulation of the U.S. telephone system as a disgrace. "Do people learn?" Dr. Deming asked.
- Dr. Deming said that consensus decision-making does not automatically lead to a better decision. He noted that enlargement of a decision process doesn't necessarily lead to optimization and again returned to his main premise: knowledge always comes from the outside. In a line Spike Lee would appreciate, Dr. Deming said, "just to do something is not right—do the right thing."
- Dr. Deming spoke briefly on the differences between Japanese and American society. He pointed out, "I don't want to hold Japan out as a

model; five of the most horrible examples in my book deal with Japanese companies," but he stressed the differences in outlook. "In Japan, someone is assumed to be good until he demonstrates beyond doubt that he is a scoundrel." He said that cooperation is natural in Japan and that the Americans and Japanese should work together for the benefit of both.

Dr. Deming illustrated differences in the way children are raised and schooled by citing a story about his friend's daughter, who was thrilled with the costume she had designed for a Halloween party at school and was having a great time until someone decided to award a prize for the best costume. The little girl didn't win and was devastated—another "loser" artificially created. Dr. Deming noted that American society, little by little, erodes self-esteem.

- As he ended his discussion, Dr. Deming reiterated his belief that there is no substitute for knowledge and warned that "everyone doing their best" is inadequate if they are doing the wrong things. "Does anybody give a hoot?" he asked.

Key Principles of W. Edwards Deming

Deming's primary thesis is that organizations thrive by releasing the power of intrinsic motivation, creating joy, pride, and happiness in work and learning for all employees. Principles, such as the importance of leadership, attainment of profound knowledge, application of statistical methodologies, understanding and harnessing the sources of variation, and adoption of a cycle of continuous quality improvement, are at the heart of Deming's philosophy.

Deming's 14 Points of Management Obligation

1. Create constancy of purpose for improvement of products and service.
2. Adopt the new philosophy; we are in a new economic age.
3. Cease dependence on mass inspection to achieve quality.
4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost and improve quality by working with fewer suppliers.
5. Improve constantly and forever every process for planning, production, and service.
6. Institute training on the job.
7. Adopt and institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations, and targets for the work force.
11. Eliminate numerical quotas for the work force and numerical goals for management.
12. Remove barriers that rob people of pride of workmanship. Eliminate the annual rating system.
13. Institute a vigorous program of education and self-improvement for everyone.

14. Put everybody in the company to work to accomplish the transformation. Establish a management system to continually focus on the preceding 13 points.

Key Principles of Joseph M. Juran

Dr. Juran focuses on strategies to attain and hold quality leadership, define roles of management for leading organizations, and enable upper level management to sustain leadership in achieving its vision.

The Quality Trilogy

Juran developed the Quality Trilogy, which provides a universal way of thinking about quality. The trilogy consists of

- quality planning, the process for preparing to meet quality goals;
- quality control, the process for meeting quality goals during operations; and
- quality improvement, the process for breaking through to superior, unprecedented levels of performance.

10 Steps to Quality Improvement

“When it comes to quality, there is no such thing as improvement in general. Any improvement in quality is going to come about project by project and no other way,” notes Juran in his book, Upper Management and Quality. Dr. Juran’s 10 steps to quality promote a project-by-project, problem-solving team method of quality improvement, in which upper management must be involved.

1. Build awareness of opportunities to improve.
2. Set goals for improvement.
3. Organize to reach the goals (establish a quality council, surface problems, select quality improvement projects, appoint teams, and designate facilitators).
4. Provide training.
5. Carry out projects to solve problems.
6. Report progress.
7. Give recognition.
8. Communicate results.
9. Keep score.

10. Maintain momentum by making annual improvement part of the regular systems and processes of the company.

Key Principles of Philip B. Crosby

At about the time that Deming's quality and productivity principles attracted interest in this country, Crosby, an International Telephone and Telegraph (ITT) executive in quality control services published a book, Quality is Free, based on his application of the total quality management philosophy and principles while at ITT. After years as a quality control pioneer, he realized that focusing on behavior of people in organizations and involving them in solving quality problems leads to employee empowerment and commitment, which in turn leads to continual improvement in work processes and service to external and internal customers.

In 1979, after 29 years with ITT, Crosby formed Philip Crosby Associates. His first significant customers were the Tennant Company and International Business Machines (IBM), with whom he maintains a consulting relationship today. Tennant wanted a quality program that could be adapted throughout the organization in manufacturing and administration. Today Tennant has more than 60 people capable of instructing 80 different topics related to Crosby's total quality management principles.

Four Absolutes

Crosby believes quality must be initiated through deliberate management action. The philosophical basis for the desired quality culture change is found in his Four Absolutes of Quality Management:

1. Quality is defined as conformance to requirements.
2. The system for causing quality is prevention.
3. The performance standard is zero defects.
4. The measurement of quality is the price of nonconformance.

14 Steps to Quality

The 14-Step Quality Improvement Process is designed to structure and position the organization for operational improvements and improved communications.

1. Make it clear that management is committed to quality.
2. Form quality improvement teams with representatives from each department.

3. Determine where current and potential quality problems lie.
4. Evaluate the quality awareness and personal concern of all employees.
5. Raise the quality awareness and personal concern of all employees.
6. Take actions to correct problems identified through previous steps.
7. Establish a committee for the zero defects programs.
8. Train supervisors to actively carry out their part of the quality improvement program.
9. Hold a "zero defects day" to let all employees realize that there has been a change.
10. Encourage individuals to establish improvement goals for themselves and their groups.
11. Encourage employees to communicate to management the obstacles they face in attaining quality goals.
12. Recognize and appreciate those who participate.
13. Establish quality councils.
14. Do it all over again to emphasize that the quality improvement program never ends.

Relationships

According to Crosby, relationships and quality are two keys to successful leadership. A management team must exercise care to avoid viewing relationships and quality as overhead functions that do not contribute directly to profitability. Crosby said, "The ecology of an organization is as delicate and vulnerable as that of a forest. Nothing happens without having an effect on something. The key to all these things within a company, as within a forest, is relationships."

Quality

According to Crosby, "Quality is the result of a carefully constructed culture; it has to be the fabric of the organization—not part of the fabric but the actual fabric. It is not hard for a modern management team to

Appendix IV
Key Principles of Philip B. Crosby

produce quality if they are willing to learn how to change and implement.”

National Quality Awards

Interest in the principles and applications of quality management is spreading rapidly. Reflecting this interest, several prestigious award programs now recognize organizations that have achieved superior levels of quality in their operations.

The Deming Prize

The oldest and most prestigious quality award, the Deming Prize, is sponsored by the Japanese Union of Scientists and Engineers and was created to honor Dr. Deming's work in Japan. To win this award, companies must submit to a rigorous, multiyear examination by independent examiners. Thus far, only one American company has received this award—Florida Power and Light. Officials of several leading U.S. companies, however, reported that they do not want to apply for the Deming Prize because of their apprehension about exposing internal business operations to teams of examiners representing a Japanese industrial association.

Malcolm Baldrige National Quality Award

The Malcolm Baldrige National Quality Award was established in 1987 and is gaining widespread acceptance among U.S. companies. This award is designed to promote quality awareness, recognize quality achievements of U.S. companies, and publicize successful quality strategies. The U.S. Department of Commerce's National Institute of Standards and Technology sponsors the award, which is administered by the Malcolm Baldrige National Quality Award Consortium, Inc., a joint effort of the American Productivity and Quality Center and the American Society for Quality Control.

In the first 3 years of the award's existence, 30 companies or divisions of companies qualified for site visits by Baldrige examiners. Nine companies have won the award: Motorola; Globe Metallurgical, Inc.; Westinghouse Corporation, Nuclear Fuels Division; Xerox Corporation, Business Products and Services Division; Milliken & Co.; IBM's AS-400 Division; Cadillac Division of General Motors; Federal Express; and Wallace and Company.

The Baldrige Award is based on an examination of a company's quality performance in the following areas:

- leadership,
- information and analysis,
- strategic quality planning,
- human resource utilization,

-
- quality assurance of products and services,
 - quality results, and
 - customer satisfaction.

Federal Government Quality Initiatives

In 1988 President Reagan issued an Executive Order calling for the establishment of "a governmentwide program to improve the quality, timeliness, and efficiency of services provided by the federal government." In that year the Federal Quality Institute (FQI) was established in the Office of Personnel Management (OPM) to stimulate quality awareness and educate government leaders about an organizational culture that emphasizes excellence, continuous improvement, strong customer service, and "doing the right thing right the first time."

President's Award for Quality and Productivity Improvement

Sponsored by the FQI, the President's Award for Quality and Productivity Improvement is given annually to an agency that has implemented TQM in an exemplary manner and is providing high-quality services to its customers. So far, only the Naval Air Systems Command has won this award. Only agencies that have received a Quality Improvement Prototype Award are eligible to win. Examiners review applicants' quality in the following areas:

- top management leadership and support,
- strategic planning,
- focus on the customer,
- employee training and recognition,
- employee empowerment and teamwork,
- measurement and analysis,
- quality assurance, and
- quality and productivity improvement results.

Quality Improvement Prototypes

Federal agencies that are achieving high standards of quality, efficiency, and timeliness in service delivery can win Quality Improvement Prototype awards. Thirteen such prototypes have been designated to date. There are 34 applications pending for recognition in 1991 at FQI, which has assumed this responsibility from OMB.

Case Studies

Defense Industrial Supply Center

Mission	The Defense Industrial Supply Center (DISC) in Philadelphia is one of six supply centers of the Defense Logistics Agency. It buys and manages 927,308 hardware items to support the military departments, federal civilian agencies, and foreign governments.
Quality Improvement Objectives	<p>In 1985, after thousands of new items had been assigned to the Center, supply availability was suffering, product quality was inadequate, back orders were accumulating, and many feared that the Center would merge with another supply center. Although a quality circles program was in place, management realized that it would have to take responsibility for quality and established a three-part command goal to</p> <ul style="list-style-type: none">• support customers by being responsive and efficient;• take care of its people; and• become a high-quality, cost-conscious center.
Scope of TQM Application	<p>Top management actively participated in quality improvement. The Center initiated a series of environmental assessments, and 22 top managers attended a Deming seminar. Using a TQM council as a steering committee, the center launched efforts in five major areas:</p> <ul style="list-style-type: none">• employee involvement through quality circles/task teams;• quality improvement planning keyed to long-term goals;• training, including the principles and techniques of process improvement;• evaluation of participative environment and measurement of the effectiveness of work processes; and• recognition for both groups and individuals.
Status and Accomplishments	<p>The program is ongoing and includes regular evaluations of the Center's status and the involvement of all employees. OMB designated the Center as a 1990 Quality Improvement Prototype. Specific accomplishments include</p> <ul style="list-style-type: none">• tangible savings of more than \$3 million,• reduction of contract processing time from 175 to 147 days,• a 39 percent reduction in procurement backlog,• a 25 percent reduction in the complaint-handling backlog, and

- a reduction in turnaround time required to test products (from 120 days to 3 weeks).

NASA Lewis Research Center

Mission

The Lewis Research Center in Cleveland, Ohio, is NASA's leader in research and technology development in aircraft propulsion and space power. It also plays a major role in space science and applications research.

Quality Improvement Objectives

A decade ago, the Center had no major role in the space shuttle program and was in danger of closing. A new director set out to revitalize the center, using the principles of total quality management. Specifically, he initiated efforts to

- develop a strategic plan that identifies and anticipates customer needs;
- encourage employee participation, creativity, and teamwork; and
- seek ways to provide top quality to all customers.

Scope of TQM Application

Key elements are

- strategic planning,
- emphasis on customer needs and satisfaction,
- "flattening" the organizational structure,
- quality circles and productivity and quality enhancement teams,
- expansion of the employee suggestion program,
- contractor incentives, and
- vigorous, visible senior management support for productivity and quality improvement.

Status and Accomplishments

Current management has enhanced and expanded the Center's commitment to excellence, teamwork, and customer satisfaction. The Center won the Collier Trophy for the year's greatest achievement in aeronautics or astronautics. OMB designated the center a 1989 Quality Improvement Prototype. Following are specific accomplishments:

- about a 40 percent increase in technical publications by staff;
- a nearly 50 percent increase in disclosures of invention;
- substantial growth in research quality, as measured by peer reviews and professional organization recognition;

- the introduction of numerous process improvements, including computer-aided design, engineering, and manufacturing;
- streamlining of procurement methods, resulting in a customer satisfaction index of about 90 percent; and
- energy conservation efforts that saved an estimated \$500,000 annually.

USDA Forest Service

Mission

The primary responsibility of the Forest Service is the effective management of the country's national forest lands. The Forest Service also has duties involving research and state and private forestry issues.

Quality Improvement Objectives

The Forest Service set out to improve the agency's management. It launched the 5-year National Pilot Test in 1985 to revitalize the agency and inject a people-oriented management philosophy. The agency introduced efforts to

- loosen constraints on people and eliminate bureaucratic red tape,
- empower the work force through increased freedom and authority at all levels, and
- improve customer service and enhance quality and productivity.

Scope of TQM Application

Key elements are

- encouraging and rewarding risk-taking, learning to accept failures as learning experiences;
- pilot testing new and creative ideas;
- allowing managers greater autonomy in the budget process, moving from a management-of-the-budget approach to management by the budget; and
- creating a quality management charter for distribution to the entire work force to communicate the agency's quality, customer, and employee-oriented values.

Status and Accomplishments

The National Pilot Test has just concluded, and the Forest Service is beginning to institutionalize the quality management philosophy organizationwide. Special programs promoting teamwork, creativity, innovation, and a customer focus have begun across the agency. The new management-by-the-budget approach has been received favorably and has allowed managers to spend more time on supervision, monitoring performance, and assessing forest needs through on-site visits.

Employee morale of those in the pilot test units has improved; the agency hopes to expand this throughout the organization with the new management philosophy.

NAVSEA 55z3 DOD Standardization Program and Documents Division

Mission

The Standardization Program and Documents Division develops, maintains, and coordinates all military and federal specifications, standards, handbooks, and bulletins. NAVSEA uses these materials in procurement documents for components, equipment, and systems.

Quality Improvement Objectives

The Ship Design and Engineering Directorate and the Specification Control Advocate General initiated a program to develop a strategic plan for implementing TQM. A team of experts studied the problems associated with the standardization process, developed initial plans for solutions, and constructed a broad strategy for implementing TQM in the standardization process.

Scope of TQM Application

Key elements are to

- generate a list of roadblocks, strategic goals, and tactical objectives;
- conduct process flow analysis;
- determine amount and cause of outdated specifications and standards;
- use Pareto analysis to determine time-consuming steps;
- develop control charts for the 13 key steps of the standardization process; and
- develop a performance measurement system.

Status and Accomplishments

The NAVSEA standardization process has improved significantly since the first session in 1989. The team has published a strategic plan to implement TQM and has focused on streamlining the process. With the current changes, the agency should be able to reduce the entire process time by 58 percent in 1 year. The Command received recognition for achieving its improvement efforts by winning the 1989 Defense Standardization Program Outstanding Performance Award.

IRS Federal Tax Deposit (FTD) System

Mission

The IRS is supposed to collect the proper amount of tax revenues at the least cost to the public. The FTD System is the single largest collector, responsible for collecting and processing various categories of tax payments from businesses.

Quality Improvement Objectives

IRS Commissioner Lawrence B. Gibbs committed the IRS to a long-term quality improvement effort. In the FTD System, 1.5 million transactions were not posted to taxpayers' accounts in a timely fashion. In addition, roughly 40 percent of customers' requests for forms were not being processed in a timely manner. Customers were getting frustrated, and problem cases were becoming unmanageable. The FTD System sought to solve these problems and improve overall quality and customer satisfaction.

Scope of TQM Application

Key elements are

- formation of a quality improvement team,
- use of Pareto analysis and other statistical techniques to help identify critical elements of problems, and
- surveys and interviews of both external and internal customers to improve products and processes.

Status and Accomplishments

As of February 1987, 157 recommendations were made. After implementing nearly all of these, the agency achieved the following:

- a 2 percent decline in unpostable transactions (errors) in 1 year, resulting in an annual savings of \$250,000 (beginning in 1988, the error rate was 0.2 percent, down from 3.1 percent in 1986);
- a reduction in errors due to incorrect ID numbers or names (errors decreased from 34,000 per week in 1986 to 1,572 per week in 1988); and
- a 50 percent reduction in errors associated with a particular form.

OMB designated the FTD System a Quality Improvement Prototype. In addition to this organization, three other IRS organizations were designated by OMB as prototypes, demonstrating the increasing awareness of total quality management at IRS.

Xerox Corporation Business Products and Systems Division

Mission	Xerox is the world's largest provider of copiers, duplicators, and electronic printers. Business Products and Systems, Xerox's largest division, with 50,200 employees and \$6 billion in 1988 sales, was one of two winners (along with Milliken & Co.) of the 1989 Malcolm Baldrige National Quality Award.
Quality Improvement Objectives	In late 1983, Xerox initiated a long-term quality improvement program, Leadership Through Quality, that had been developed during a 15-month period. At the time, higher quality, less expensive Japanese copiers were threatening Xerox's long-term survival in the copier business. As part of Leadership Through Quality, Xerox promoted a quality policy: Quality improvement is the goal of every Xerox employee.
Scope of TQM Application	<p>Leadership Through Quality specified a 5-year cultural change strategy that contained six mechanisms:</p> <ul style="list-style-type: none">• management leadership demonstrated through daily practice,• transition teams to support line management,• new standards and measurements to help Xerox employees assess and perform their work,• training to provide every Xerox employee an understanding of Leadership Through Quality,• recognition and reward for both individuals and groups who assist the quality improvement effort, and• communication to keep all Xerox people informed of the progress of Leadership Through Quality. <p>Xerox also pioneered the technique of benchmarking performance in all operational areas according to outside standards.</p>
Status and Accomplishments	According to Dataquest, an independent market analysis firm, five of the six highest quality copiers in the world today are built by Xerox. Xerox's 1075 copier won the Japanese Ministry of International Trade and Industry's 1989 grand prize for industrial design. Xerox performs well above industry standards in customer service, manufacturing productivity, and employee relations and safety. Xerox is also gaining market share in all key worldwide markets.

3M Corporation

Mission

3M is a highly diversified company that markets more than 50,000 products worldwide. Tom Peters, in *Thriving in Chaos*, described 3M as the only truly excellent U.S. corporation today. *Forbes* cited 3M as one of America's three most highly regarded companies. 3M has 82,000 employees worldwide and had 1989 sales of almost \$12 billion.

Quality Improvement Objectives

In 1980 the company established a Corporate Quality Department to define quality objectives and design a strategy to implement continuous quality improvement throughout the corporation. 3M sought to reinforce its innovative culture with a sharpened focus on meeting customer requirements.

Scope of TQM Application

3M defined five essentials of quality.

- Quality is defined as consistently meeting customers' expectations and has three elements: consistency, expectation, and the customer.
- Quality is measured through indicators of customer satisfaction.
- Customer expectations should be met 100 percent of the time.
- Quality is attained through prevention-oriented improvement projects.
- The quality process starts with management commitment.

3M's implementation strategy had the following key elements:

- defining 3M's quality vision,
- changing management perceptions through specialized training,
- empowering employees to focus on and satisfy customer expectations, and
- sustaining the process through an ongoing culture change.

Status and Accomplishments

3M's approach to quality is now so highly regarded that executives from leading U.S. companies regularly travel to St. Paul to attend monthly briefings sponsored by 3M. Quality indicators tracked by 3M's quality office—cost of poor quality, defect rates, cycle times—are well ahead of industry standards. 3M's return on equity and profits hit record highs in 1989. And, most importantly, 3M's culture is seen as a model for large organizations, fostering innovation and teamwork.

Motorola, Inc.

Mission

Motorola is a leading manufacturer of electronic equipment, systems, components, and service. Products include two-way radios, cellular telephones, semiconductors, defense and aerospace electronics, automotive and industrial electronics, computers, data communications, and information processing and handling equipment. Motorola was a 1988 winner of the Malcolm Baldrige National Quality Award.

Quality Management Objectives

In 1981 Motorola established a fundamental goal of improving its quality by 10 times by 1986. All Motorola employees became members of a participative management program (PMP) team and were empowered to assess and improve their work processes. The Motorola culture assisted the process—Motorola was seen as a caring, loyal company. For example, no employees with 10 years of service can be released without the explicit approval of the CEO.

In 1987 after successfully meeting its 1981 quality objectives, Motorola restated its quality goal: to improve 100 times by 1991 and to achieve six sigma capability by 1992.

Scope of TQM Application

Motorola applied TQM to every aspect of its operations and six sigma to every significant business process. To focus its quality improvement efforts, Motorola adopted a common metric to every process: a defect is anything that causes customer dissatisfaction; a unit is any unit of work.

Motorola's TQM implementation had the following key elements:

- establishment of "Motorola University," a \$150 million investment to teach state-of-the-art TQM principles;
- consistent focus on quality by the CEO and Chairman;
- annual CEO quality awards to recognize superior quality achievements by Motorola employees;
- regular contacts between all Motorola managers and customers; and
- consistent emphasis on cycle time reduction.

Status and Accomplishments

Six sigma capability is used as a benchmark metric for an increasing number of U.S. companies. Motorola has received more awards for excellence as a supplier than any other U.S. company and is widely acknowledged as a quality leader. Sales and profit margins were at record highs in 1989.

North American Automotive Group of Ford Motor Company

Mission

Ford is the world's second largest industrial corporation and the second largest car and truck concern. The North American Automotive Group is the only U.S. automobile manufacturer increasing its market share in North America and was a finalist for the 1989 Malcolm Baldrige National Quality Award.

Quality Management Objectives

In 1981 when it was losing \$1,000 on every automobile it sold, Ford began shifting to a total quality culture. Ford engaged Dr. W. Edwards Deming to facilitate the change. Ford's objective was to change the fundamental way in which its 300,000 worldwide employees interacted with each other.

Scope of TQM Application

Ford focused on five major areas:

- using new methods to improve its manufacturing process and establish a continuous improvement culture,
- empowering its employees through a program called employee involvement (EI),
- benchmarking world-class performance standards and using these as fundamental targets in developing new products,
- establishing partnerships with its dealers and suppliers, and
- restructuring the organization to become more efficient and cost effective.

EI was critical to Ford's turnaround. Ford established a new relationship with the United Auto Workers to build teamwork into the production process. EI has been in place for 10 years, driven by team building and education. Communications and an active employee suggestion system are other key elements.

Status and Accomplishments

Quality improvement is a never-ending process. In 10 years, however, Ford has made remarkable improvements in the quality of its products and its culture. Ford earns \$600 profit on every automobile it sells; GM earns \$25, Chrysler earns \$225. Ford is gaining market share, and in 1988 had a higher net income than GM with only two-thirds the amount of gross revenues. Ford is also the leading foreign producer in the competitive Japanese market.

GAO Prototypes/Pilots

Ongoing Quality Management Prototype of the National Security and International Affairs Division (NSIAD) Trade, Energy, and Finance (TEF) And Economic Analysis Groups (EAG)

Overview

NSIAD's TEF and EAG Groups are developing a new approach to their work based on the continuous quality improvement management model. TEF's and EAG's objectives are to adapt quality management principles to GAO to create a process yielding continuous improvement in the quality of products and a reduction in costs and to create a work environment of greater employee involvement and job satisfaction. For the effort to succeed, it requires a change in the corporate culture, an identification of customer expectations, a consensus-oriented human relations strategy, employee empowerment and involvement, and a redefinition of work processes and products. The effort is designed to build quality into all work processes, rather than at the end of jobs.

Description

The focal point of TEF's and EAG's prototype will be a quality council comprised of the Director and Assistant Directors and elected representatives from Bands I and II and the administrative staff. The council will identify and establish priorities for key quality and productivity-related issues and designate continuous improvement teams (CITS). These CITS, staffed by interested employees and operating under the purview of the quality council, will address specific issues.

This pilot will require a considerable investment in training—the entire staff will be trained in quality management principles—and in time because of the work of the CITS.

Issues to Be Examined

Following are the tentative issues that have been identified:

- defining the mission and purpose of TEF's and EAG's work and creating a structure conducive to this work;
- identifying all of TEF's and EAG's external and internal customers and surveying them to determine how well their expectations are being met;

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- designing an alternative approach to appraising, recognizing, and compensating TEF and EAG staff that creates a pride of workmanship, self-esteem, and enhanced dignity;
 - defining TEF's and EAG's full range of products and services and identifying opportunities for improving the work processes in developing them;
 - evaluating the prototype's impacts on TEF's and EAG's interactions with other GAO units; and
 - identifying opportunities for eliminating unnecessary administrative and other tasks that add no value to TEF's and EAG's work processes.

The quality council will determine the scope of all efforts by the CITs.

Status and Accomplishments

Quality council elections were held in late September 1990. On October 1, 1990, all TEF and EAG staff received a full day of awareness training in the principles and philosophies of quality management. Following this basic awareness training, employees will begin shaping the CITs and outlining approaches to problem solving. A continuous training and education program will be implemented for all staff. TEF and EAG want to achieve two seemingly outrageous goals during the pilot:

- reduce the time between the end of audit work and the issuing of the report to 1 month, while improving quality; and
- adopt a new appraisal, recognition, and compensation system consistent with continuous quality improvement principles.

TEF and EAG will share their experiences on an ongoing basis with other GAO units.

Proposed Organizational Restructuring Prototype of the General Government Division (GGD)

Overview

GGD has spent the last 9 months carefully analyzing its current organizational structure and procedures to see how it might better respond to the conditions and challenges of the 1990s. Specifically, GGD found that

- many staff members (and the newer ones in particular) felt they were not being fully challenged by their assignments,

- the organizational structure reinforces the inefficiencies of a peaks-and-valleys approach to individual assignment management,
- we are losing strategic thinking and perspectives that come from focusing on an integrated body of work rather than on a loosely coupled set of individual jobs,
- the pressures for timeliness and quality will continue to grow even though our current organizational structure has reached its limits to respond, and
- diffuse accountability in the regional structure works against timeliness and quality.

Description

To respond in a more timely way to the changing environment in which policy is developed and reformulated by the Congress, GGD decided that organizational arrangements did not meet its needs anymore. The congressional timeframe for policy analysis and decision-making has been greatly compressed. Consequently, GAO has less time in which to develop and present its analysis to the Congress if the information is to be useful. To ensure that GAO continues its role as an active participant in the policy dialogues on the nation's pressing issues, we must develop new and improved ways of doing our work—ways that improve our timeliness, enhance our product quality, and best use staff skills and abilities.

To that end, GGD has developed two models as alternative ways to restructure how it does its work. Three design teams in the division developed these models. While the structures proposed in the two models vary (see figs. VII-1, VII-2, and VII-3), the underlying purpose for both remains the same—to achieve the five objectives listed above.

An emphasis in each issue area on the Assistant Directors' managing a body of work is critical to the organizational changes proposed in the GGD models. Each Assistant Director would be assigned staff and a cluster of assignments. The strategy followed in each model presumes that staff would be on multiple assignments simultaneously and that team assignments and responsibilities would replace traditional hierarchical decision-making. The staff working for an Assistant Director would come from both headquarters and the regions. Like the headquarters staff, regional staff would be assigned to a team, report to the GGD Assistant Director, and be part of the GGD appraisal and compensation systems.

Both models retain permanent pay and bonuses as key elements of the compensation system. In Model #1, permanent pay would be based on

judgments about individual performance, while the bonus money would all be allocated to teams; the team members would decide the amount each person would receive. In Model #2, permanent pay would also be based on judgments about individual performance, while the bonus money would be split and offered to both individuals and teams. Changes in models are proposed for the Behaviorally Anchored Ratings Scales (BARS) system, both in content and in the number of dimensions under which any staff member would be assessed.

Enhancing the technology used in the division would also be emphasized to better meet the customized information needs of the specific issue area.

Issues to Be Examined

By restructuring the organization and the way it does its work, GGD wants to achieve the following explicit objectives:

- create a more challenging work environment for staff by letting them choose those areas where they can make their best contributions;
- achieve greater timeliness in work by having staff work on multiple assignments simultaneously;
- achieve the higher quality that comes from the flexibility to marshal the necessary resources from the beginning of a study;
- establish clear lines of authority and responsibility for all staff involved in the work through new performance management and compensation arrangements; and
- achieve both a substantive and policy integration of our work that comes from shared knowledge, information, and responsibility among staff.

Figure VII-1: Issue Area Organization for Model #1

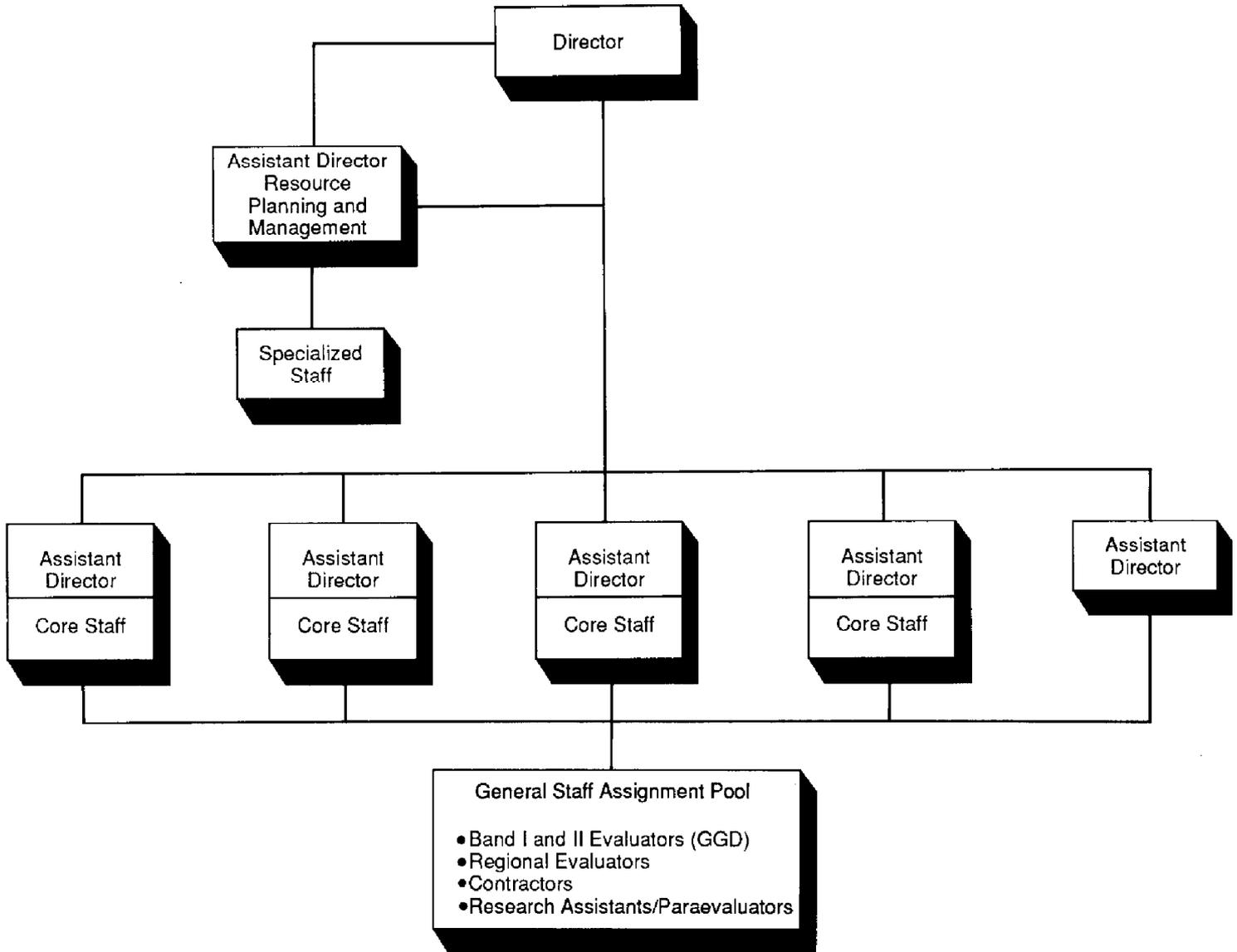


Figure VII-2: Revised Pay and Bonus System for Model #2

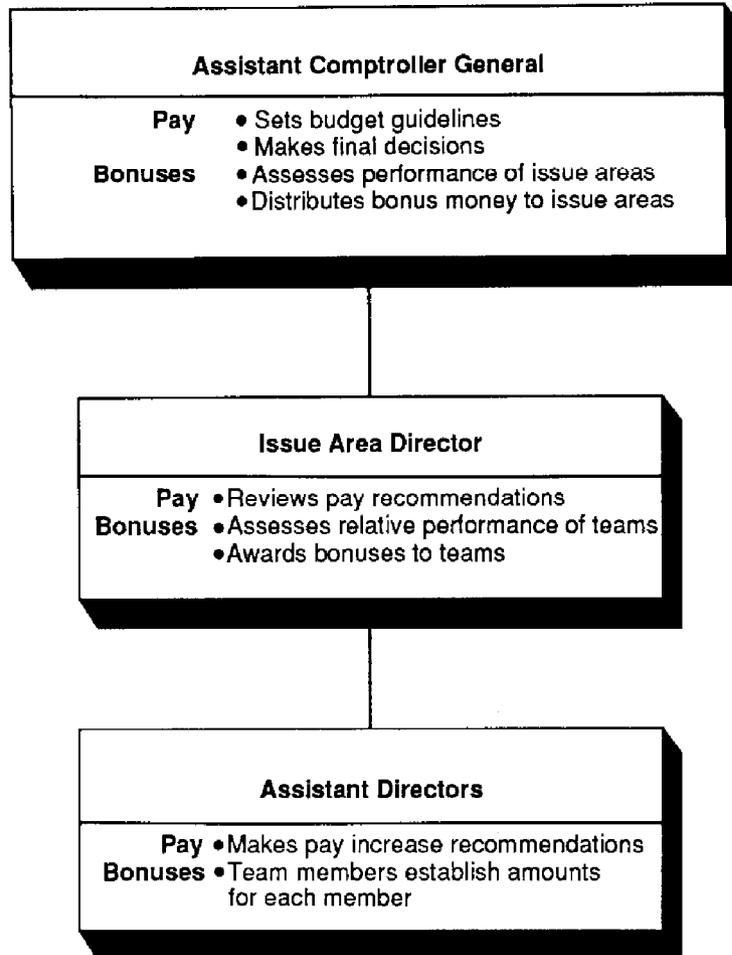
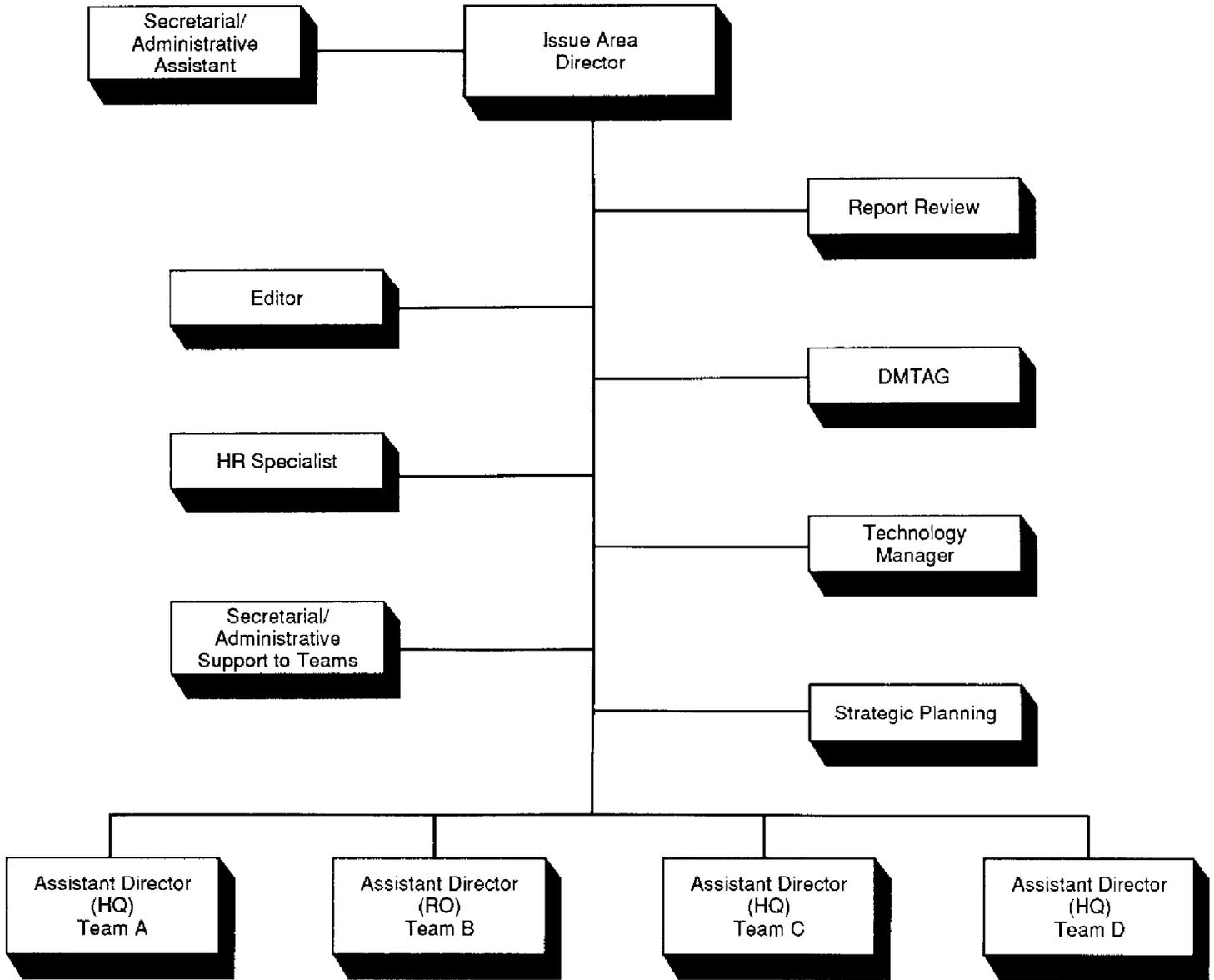


Figure VII-3: Issue Area Organization for Model #2



Glossary of Key Terms

Benchmarking	A process used to identify the best practices from industry and government that may be directly or indirectly related to an organization to continually improve and achieve the best in all efforts or work methods.
Constancy of Purpose	A principle used by Dr. W. Edwards Deming to look at improvement of product and service. It promotes a plan to stay in business and constantly improve to remain on the leading edge through innovation and research in the mission of the organization.
Cross-Functional	A term used to describe individuals from different business units or functions who are part of a team to solve problems, plan, and so on to develop a solution or product affecting the organization as a system.
Culture	The pattern of shared beliefs and values that give the members of an organization rules of behavior or accepted norms for conducting operational business.
Empowerment	A term used to create ownership at all organizational levels. It includes involving staff in problem identification and solving, planning, and so on to enable individuals to have implicit power and motivation to carry out authorities and responsibilities to achieve the highest in product or service quality.
Pareto Analysis	A statistical method of measurement to identify the most important problems through different measurement scales, for example, frequency, cost, and so on. It directs attention and efforts to the most important problems.
Six Sigma	A statistical term that indicates a defect level of not more than 3.4 parts per million units produced used as a target by Motorola and others.
Statistical Process Control	The use of statistical techniques, such as control charts, to analyze a work process or its outputs. This data can be used to identify deviations to take appropriate actions to achieve and maintain a state of statistical control (predetermined upper and lower limits) and to improve the capability of the process.

Memo: Guidelines for Setting Work Priorities



United States
General Accounting Office

Memorandum

Date: April 11, 1990
To: Heads of Divisions and Offices
From: *Charles A. Bowsher*
Comptroller General
Subject: Guidelines for Setting GAO Work Priorities

At this year's Management Conference, I stressed our need to have clear and consistently applied criteria or guidelines which we can use to help set our work priorities. Such guidelines can serve as a useful reminder of our assignment philosophy as we face the difficult assignment decisions which continually confront us.

Since the conference, the Office of Program Planning has held discussions with members of the Job Starts Group as well as each division Assistant Comptroller General and Director for Planning and Reporting to develop these guidelines and identify an appropriate implementation strategy. The resulting guidelines and some implementation considerations are attached. As you will notice, there are no surprises or new assignment policies contained in the guidelines. For the most part, these are a restatement of the philosophy we have been emphasizing for some time. By reinforcing this philosophy, however, I am hopeful we will be able to "tone up" our workload and maximize the support we provide the Congress and the contributions we make to the American taxpayer.

The focus for implementing these guidelines resides with GAO managers. However, successful implementation requires that all staff involved in assignment planning and negotiating have a thorough understanding of the guidelines and how they are to be used. To facilitate this understanding, I encourage our senior managers to meet with their staff to discuss the guidelines and the context in which they are to be used. Concurrent with these efforts, the Office of Congressional Relations is meeting with key congressional committees to discuss the guidelines and our strategy for implementing and using them in future assignment negotiations.

Attachment



ATTACHMENT

ATTACHMENT

**U.S. GENERAL ACCOUNTING OFFICE
GUIDELINES FOR SETTING WORK PRIORITIES**

THE CONTEXT

Since the early 1980s, GAO has seen its congressional request workload increase dramatically to a point where more than 80 percent of GAO's work is in response to congressional requests. To meet the reporting challenges posed by this level of request activity, we have taken a number of steps to increase our responsiveness to Congress including the introduction of new product lines, greater emphasis on testimony and the devolvement of report review and signature authority.

The recent "Indicators" report shows that we have indeed been successful in better managing our workload--we are completing more assignments, issuing more reports, and providing more testimony and doing so with essentially the same resources we had a decade ago.

Along with this success, comes the new problem of meeting the ever increasing demand for our work while anticipating and preparing for the important issues of the future.

As we enter the decade of the 1990s, significant events are unfolding in the United States and around the world which will impact heavily on GAO's workload. The political and economic restructuring in Europe raises important issues related to U.S. competitiveness in world markets and to defense force reduction and realignment.

At the same time, problems with the budget deficit create challenges in our ability to provide adequate programs and services in areas such as health care, education, energy, transportation, and the environment. Finally, the professionalism and management of government itself requires urgent attention.

To be in a position to effectively address these issues, we must make prudent choices regarding the work we do, both that which is congressionally requested and that which we undertake on our own initiative. Consequently, GAO's assignment planning and negotiation process should be driven by a set of principles or guidelines designed to provide an appropriate mix of work and optimize GAO's usefulness to the Congress and to the people of the United States.

THE GUIDELINES

GAO's fundamental responsibility is to support the Congress. This support should, to the extent possible, emphasize assignments which maximize the effectiveness of the Congress as a whole and which have the potential to make major impacts on programs and issues of national significance and importance. To do so, GAO must maintain a broad governmental perspective and the expertise to work on a wide variety of topics. Moreover, GAO resources should be focused on assignments having the potential to achieve at least one, and preferably more than one, of the following objectives:

- Contribute to congressional decisionmaking on significant public policy issues.
- Fulfill statutory and legislative requirements and commitments.
- Identify and eliminate serious mismanagement, fraud or abuse.
- Realize large dollar savings to the government and the taxpayers.
- Change policies, procedures and management structure of major government programs to better achieve desired program results and/or achieve objectives at lower cost.
- See that major government programs comply with applicable laws and regulations and funds are spent legally.
- Ensure that funds of major government programs are accounted for accurately.
- Enhance GAO's methodological and technical skills.

GAO is required to do work requested by committee chairmen and our policy is to assign equal status to requests from ranking minority members. In addition, many of the requests from individual members will, undoubtedly, fit the criteria. Consequently, when determining the timing of a particular request assignment, or the resources needed, the following questions should also be considered:

- Could another entity more appropriately or effectively satisfy the request?
- Are we performing the assignment in the most efficient way which will meet the customers' needs?

The answers to these questions may lead us to suggest other ways for some requesters to satisfy their needs, such as through our congressional support sister agencies or the inspectors general. We should also attempt to reach agreements on scheduling, prioritizing, and scoping that enable us to most efficiently complete jobs with a minimum of disruption to other important ongoing and planned work.

IMPLEMENTATION CONSIDERATIONS

These guidelines are intended to serve as a framework or set of principles which can be used to assess self initiated job proposals and incoming requests and to guide negotiations with congressional staff. To alleviate any misunderstandings or false expectations among the staff, it should be clear that these guidelines are not intended, nor should they be used, as a set of "hard and fast rules" for mechanically making "go/no go" decisions about a particular assignment.

We must keep in mind that the Congress has a wide diversity of interests and needs, and that we operate in a pluralistic society with a complex form of government. Thus, each assignment and resource decision must be made after fully considering current and anticipated workload, the nature and history of the assignment area, and the individual assignment's policy context. These decisions will often be difficult, and will continue to be made by our ACGs and Issue Area Directors using discretion and good judgment.

Overall, our leaning toward or away from certain kinds of work should be discussed with congressional staff and members in terms of a best approach to the work, workload considerations and trade-offs. Discussions and negotiations of individual jobs should be likewise approached in terms of committees' needs or our long term planning horizon, rather than searching for sponsors for a specific GAO project or assignment.

Where an individual request is not consistent with these guidelines and we believe that other work is likely of greater value to the Congress as a whole, we should make every effort to advise the requester of alternative methods for getting needed information or satisfying the requirements in more efficient ways.

Major Contributors to This Report

Ira Goldstein, Assistant Comptroller General for Operations
Gilbert M. Mayhugh, Project Director
Craig A. Anderson, Project Assistant

The following individuals also contributed to this project:

Austin Acocella, ACG-Ops
Beth Blevins, Technical Library
Liz Gilmore, Writer-Editor, PCC
Joan M. Hollenbach, OGC
Sarah F. Jaggar, HRD
Nancy Hamilton, Administrative Support
Maureen D. Machisak-Herndon, Publication Director
Allan Mendelowitz, NSIAD
Ray C. Rist, GGD
Brenda J. Thomas, Technical Support
Robert G. Wanschura, Assistant to Publication Director
McManis Associates, Inc., Project Consultants

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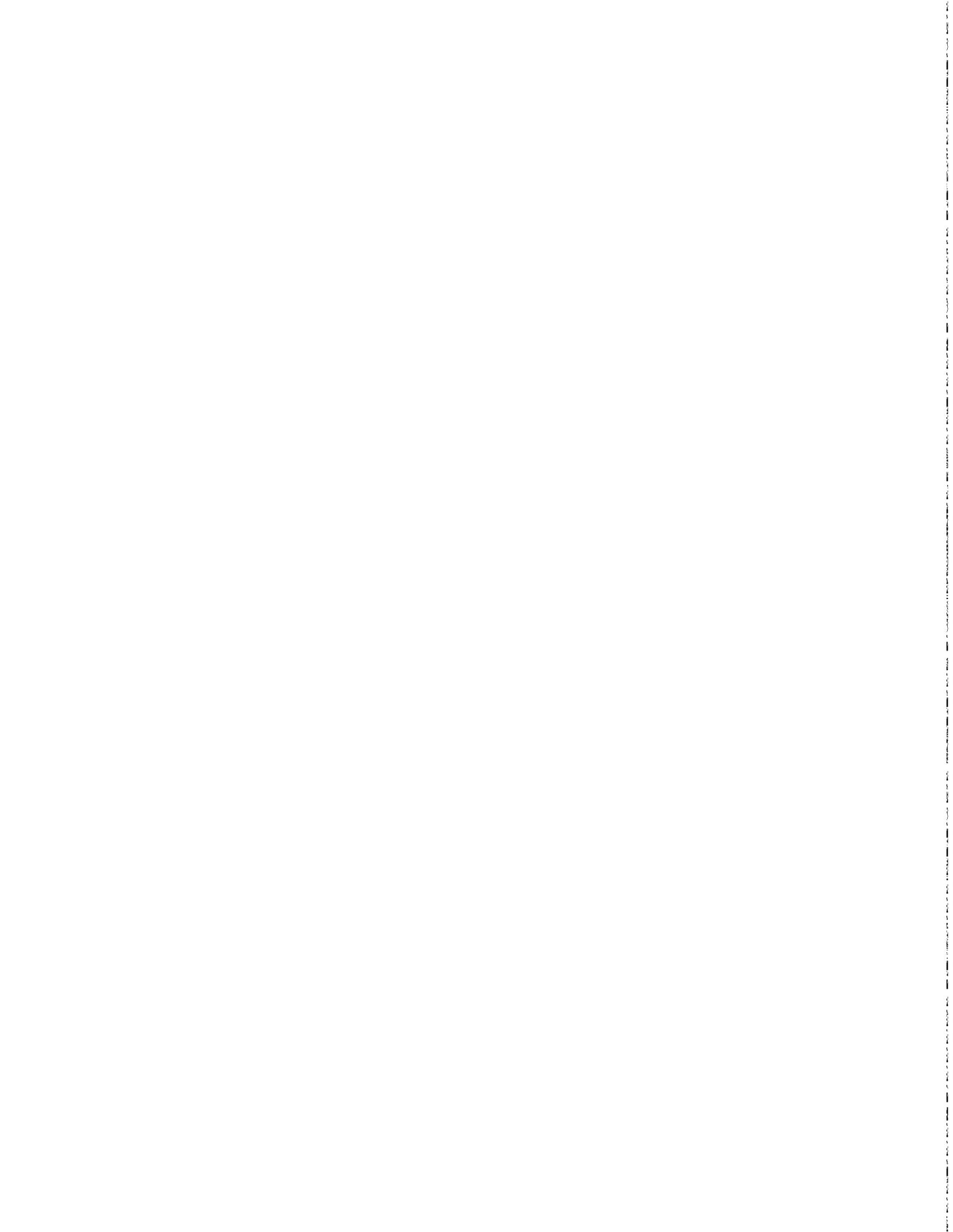
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